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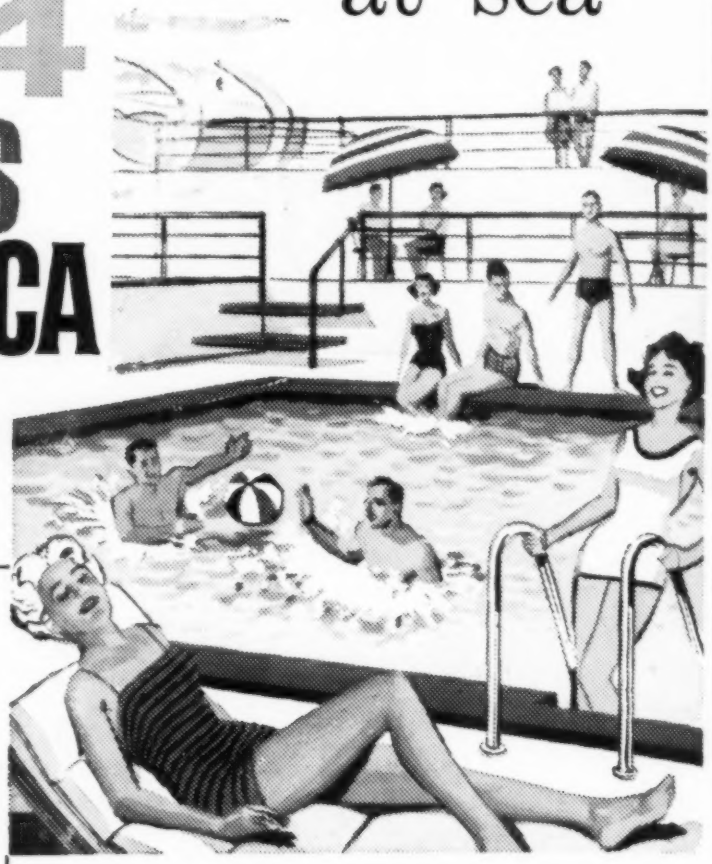

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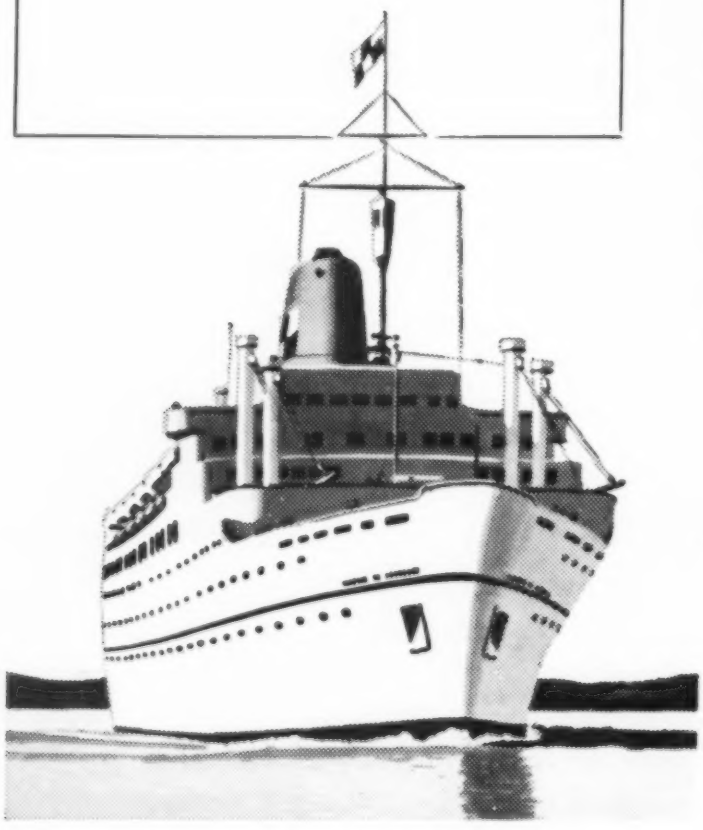

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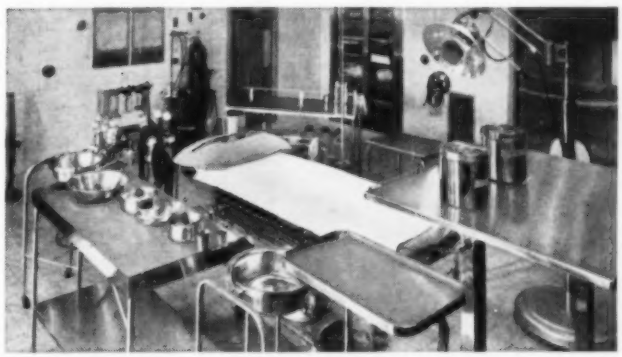

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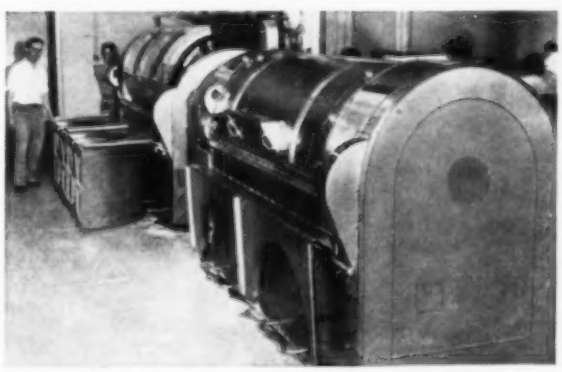

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Editor - WILLIAM J. MEGILL

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The articles in this Journal are indexed in the *International Index to Periodicals* and in the *Canadian Index*.

The British standard of spelling is adopted substantially as used by the Government of Canada and taught in most Canadian schools, the precise authority being the Concise Oxford Dictionary, fourth edition, 1951.

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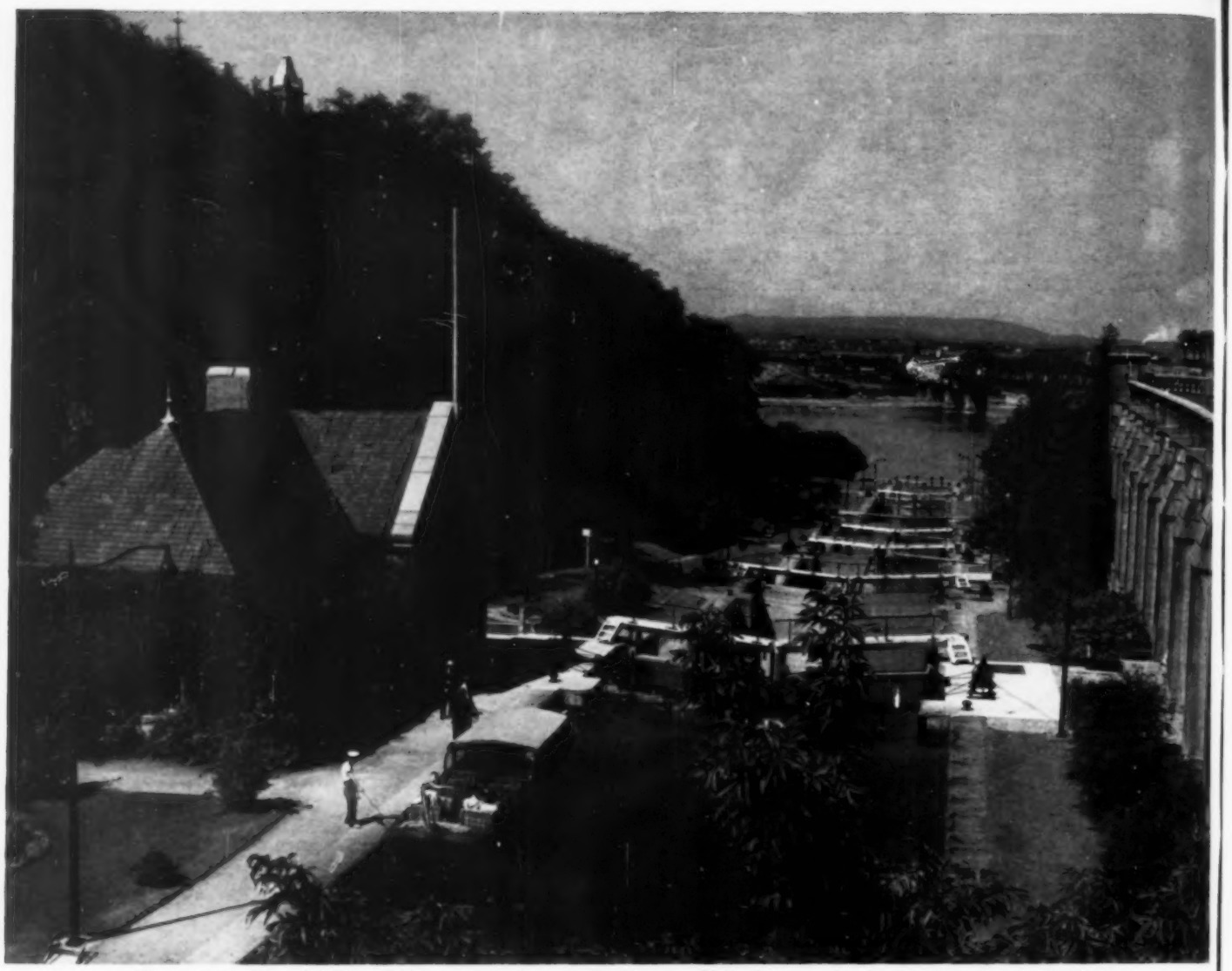

The Rideau Canal locks at the eastern foot of Parliament Hill, Ottawa. In the background is the Interprovincial Bridge linking Ottawa and Hull, Quebec, and in the distance, the Gatineau Hills can be seen.

Canal Systems of Canada

by W. H. VAN ALLEN

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THE INCREASING popularity of motor boating in Canada, coupled with the healthy economics of water-borne transportation on the recently developed St. Lawrence Seaway, have focussed public attention on this country's other inland waterways and more especially the interconnecting shallow-draft canals. The Ottawa and Rideau Canal systems, the Trent Canal and the Chambly and St. Ours system have become so popular with the water-borne tourists that at certain periods of the vacationing season, the existing hand-operated locks are hard put to it to accommodate all traffic. In fact, saturation of traffic is often reached on popular week-ends.

When the St. Lawrence Seaway Authority took over existing canals on the main Great Lakes — St. Lawrence Route as part of the new Seaway system on April 1, 1959, these minor canals remained with the Marine Services of the Department of Transport under a special Canals Division. These canals, with depths ranging from 4 to 12 feet, had until then been considered of secondary importance in comparison with the main canal system.

Today these minor canals and waterways are meeting a need which has developed almost overnight. As an indication of the trend, traffic increased by nearly 11,000

lockages on the Rideau Canal system during the past five years to a total of 36,110 in 1959, of which 96 per cent were pleasure craft. On the Trent system, the number of lockages increased from 17,930 in 1954 to a total of 39,141.

With congested highways, motor-boating has developed into a pastime which has placed the power boat as the second most important means of week-end and vacation travelling on the North American continent. While motor boating in Canada has not reached the popularity it enjoys in the United States, the number of week-end yachtsmen on Canadian lakes, waterways, canals and coastal areas has almost trebled in the past eight years. At the present time there are about 750,000 small boats being used by Canadians, half of which are powered by motors of 10 horsepower and over.

Low-cost transportation to sea-ports by the Great Lakes — St. Lawrence water route has, over the years, done much to expand Canada's overseas markets and has, in no small measure, made possible the development of Canada's famous wheat fields. Water transportation from the head of the lakes to seaports on the lower St. Lawrence or to trans-shipment ports on the lower lakes, has carried the bulk of Canada's grain exports over the past century. Today, with the creation of the St. Lawrence Seaway, equipped to accommodate the largest grain and ore carrying ships, the cost of transportation of this country's grain crop has been considerably reduced, placing Canada in a better bargaining position on the wheat markets of the world.

As a result of such economies achieved on the St. Lawrence Seaway, there is a growing demand for the enlarging of canals and locks on some of the more important secondary canals and for modernizing existing equipment to accelerate operations. In some cases, the demand is for new canals, as in the case of the proposed Chignecto Canal which would join the Bay of Fundy with the St. Lawrence River.

At Confederation, one of the first departments to be created was Public Works which assumed control and operation of existing main-line and secondary canals. A short period later, the Department of Railways and Canals was formed, taking over the canals from Public Works. In 1936, Railways and Canals became an integral part of the Department of Transport which amalgamated into one government unit all federally-owned communication and transportation facilities. On April 1, 1959, the principal main-line canals were turned over by the Department of Transport to the St. Lawrence Seaway Authority which reports to Parliament through the Minister of Transport.

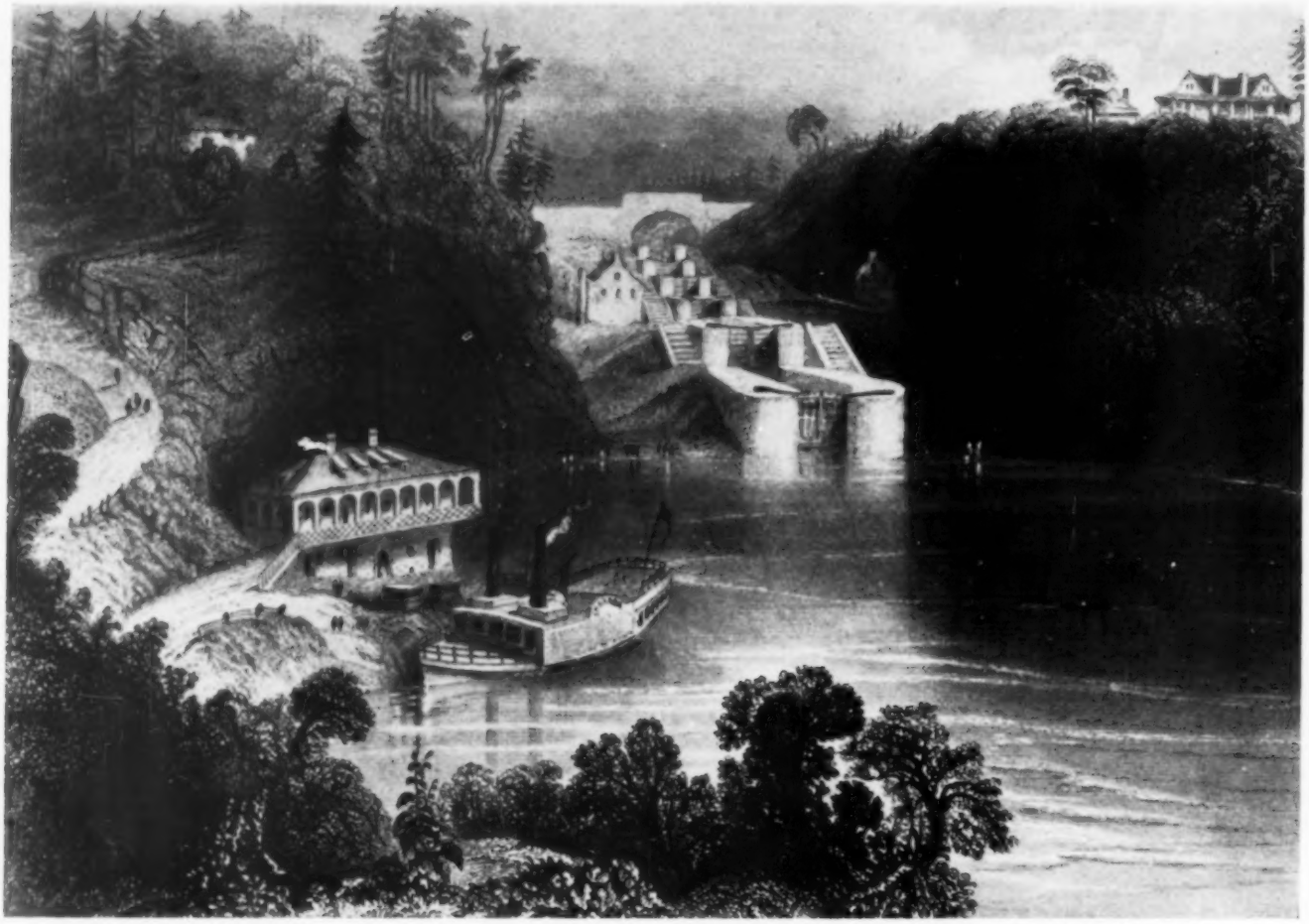
First Canals in the New World

It is interesting to note that Canada was the first in the New World to develop canals for the transportation of articles of trade and for the convenience of early settlers. Excavations carried out in 1948 near Midland, Ontario, on the site of the Jesuit Mission to the Indians built in 1639 and known as "Sainte Marie among the Hurons", revealed the existence of a 460-foot long canal deep enough to float small rafts. The canal passed between the European and the Indian compounds and thence to an aqueduct which supplied the Mission with its water.

It was by means of this canal, leading from the Wye River to the very centre of the Mission, that the tons of stone required for the foundation walls as well as the immense timbers used in the construction of the buildings and the iron ore used in the foundry, were floated to their required destination. Excavations show ruins of well defined locks and turning basins leading to a building showing traces of having been the carpentry shop, and to a combined blacksmith shop and foundry.

The "Mission of Sainte Marie among the Hurons" lasted only ten years when it was wiped out and set to the torch by the Iroquois and all its personnel massacred.

Also associated with the early days of Canadian history is the Lachine Canal at Montreal. Father Dollier de Casson, Superior of the Sulpician Order, projected the construction of a canal which would connect Lachine with Montreal by skirting the Sault St. Louis Rapids later known as the Lachine Rapids. The project provided for the excavation of a mile-long canal, without locks, from Lake St. Louis to Lac à la Loutre or Little Lake St. Pierre (no longer existing) as well as



A sketch by W. H. Bartlett of the locks on the Rideau Canal at Bytown (now Ottawa), published in 1841. The Sappers' Bridge, centre background, was removed shortly after 1841. The lock-house on the right side of the canal still stands and is now the office of the Ottawa Historical Society. Public Archives

the deepening of Little River St. Pierre to its mouth on the St. Lawrence at Montreal. The depth of the proposed canal was to be 18 inches at the lowest level of the St. Lawrence. This canal was to have been the starting point for the brigades of canoes to the fur country and was designed to provide space for the passage of one canoe at a time.

On October 30, in the year 1700, Father Dollier de Casson let a contract for the excavation of this canal. Unfortunately, the contractor, Sieur Gédéon de Catalogne, at that time a Lieutenant of Marine and Royal Surveyor, ran out of funds when only a cutting of 3 to 4 feet remained to be completed over a length of 800 yards. All work was discontinued by February, 1701, and a final blow to the project was dealt by the death of Father de Casson in October of that year. In 1708, King Louis XIV of France ordered plans and estimates of work to be carried out but made no provision for funds and no work was undertaken. While incompleted, the canal was probably used, however, by canoes during high water periods.

In 1779, the Royal Engineers built a chain of small canals with locks which overcame the numerous rapids between Lake St. Louis and Lake St. Francis. They were only 2½ feet deep and were only wide enough to permit one bateau to pass through at a time. Between 1801 and 1804, this was enlarged to permit passage of six bateaux at a time.

Fourth oldest canal in Canada was at Sault Ste. Marie where in 1798 the North West Fur Company had a shallow canal dug to circumnavigate the more difficult parts of the Sault Rapids on the St. Mary River between Lake Huron and Lake Superior. This was the first navigation improvement undertaken on the Upper Lakes. This early canal was 2,580 feet in length with a raised pathway of round logs at the side for oxen to tow the boats from the end of the lock and up a sluiceway to Lake Superior. The original lock was 38 feet long, 9 feet wide and had an 18-inch depth at the sill. The lower gate of the lock was opened by a windlass while the upper end of the lock was equipped with two folding gates and a sluice.

The historian Gabriel Franchère reports in his *Relation d'un Voyage*, written in 1820, that on his arrival at the east end of Michipecoten Bay on July 26, 1814, he met Captain McCargo and a crew of one of the schooners of the North West Fur Company who had escaped from Sault Ste. Marie. According to them, about 150 United States troops in command of a Major Holmes had attacked the post, pillaged it of every article of value and set fire to all the houses, stores, sheds and other buildings.

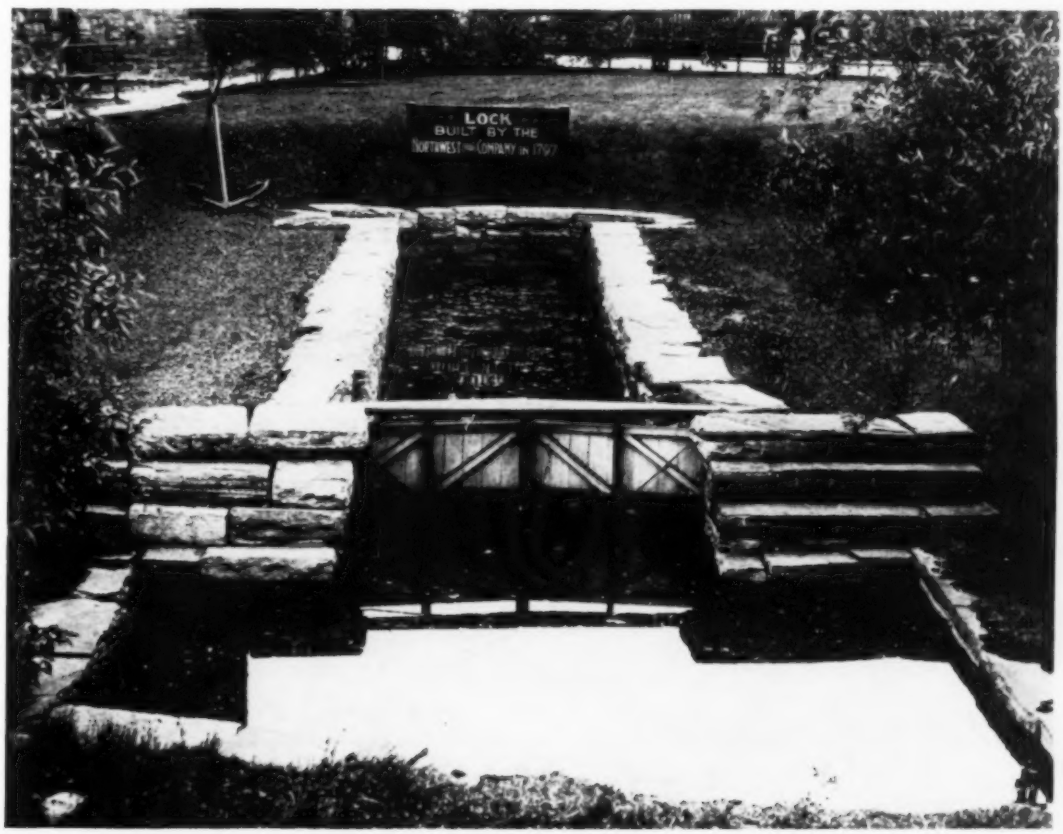
Mr. Franchère, accompanied by others, went to Sault Ste. Marie four days later and found the ruins of the buildings still smoking and the schooner driven down to the foot of the rapids where it had been burned to the water's edge. The lock gate of this original lock at Sault Ste. Marie Canal escaped complete destruction and is today a showpiece on a public lawn near the present Canadian canal.

The Canal Building Era

After the War of 1812, a joint commission of Upper and Lower Canada reported in favour of building a canal system with four-foot depth of water for the St. Lawrence River and in 1821 Government Commissioners were appointed to build the first Lachine Canal. This canal, which was completed in 1825, provided seven locks with a water depth of 5 feet at the sills. The locks were 100 feet long and 20 feet wide. Between 1843 and 1848 this waterway was enlarged reducing the number of locks to five with 9 feet of water. In 1885 another enlargement was completed. These locks were 270 feet long and 45 feet wide. The two main locks and part of the reaches had a depth of 17 feet while the remainder were 14 feet deep. The Lachine Canal today is 8.7 miles in length and provides a total rise in lockage at mean stage of 46 feet, overcoming the difference in level between the Harbour of Montreal and Lake St. Louis.

Shortly after the opening of the first Lachine Canal, the Royal Engineers, then constructing the Rideau Canal, recommended larger and wider locks and a 9-foot depth of water for the St. Lawrence canals. It was not, however, until 1834 that work began on the construction of the Cornwall Canal and 23 years elapsed between the opening of the first Lachine Canal and the completion of the last St. Lawrence canal between Montreal and Prescott. The locks of these canals had a length of 200 feet, a minimum width of 45 feet and a depth of 9 feet.

Insofar as the Ottawa-Rideau canal systems and the Trent Canal were concerned, their origin stemmed from a report by the



The original lock gate of the Canadian Sault Ste. Marie Canal destroyed in the War of 1812.

Duke of Wellington on the defence of Canada. They were designed for the transportation of armed forces and as back doors to the Great Lakes in case of another invasion from the south. The Duke of Wellington's report, dated London, March 1, 1819, recommended a series of waterways north of the Great Lakes which would give access to Lake Ontario, Lake Huron and Lake Erie.

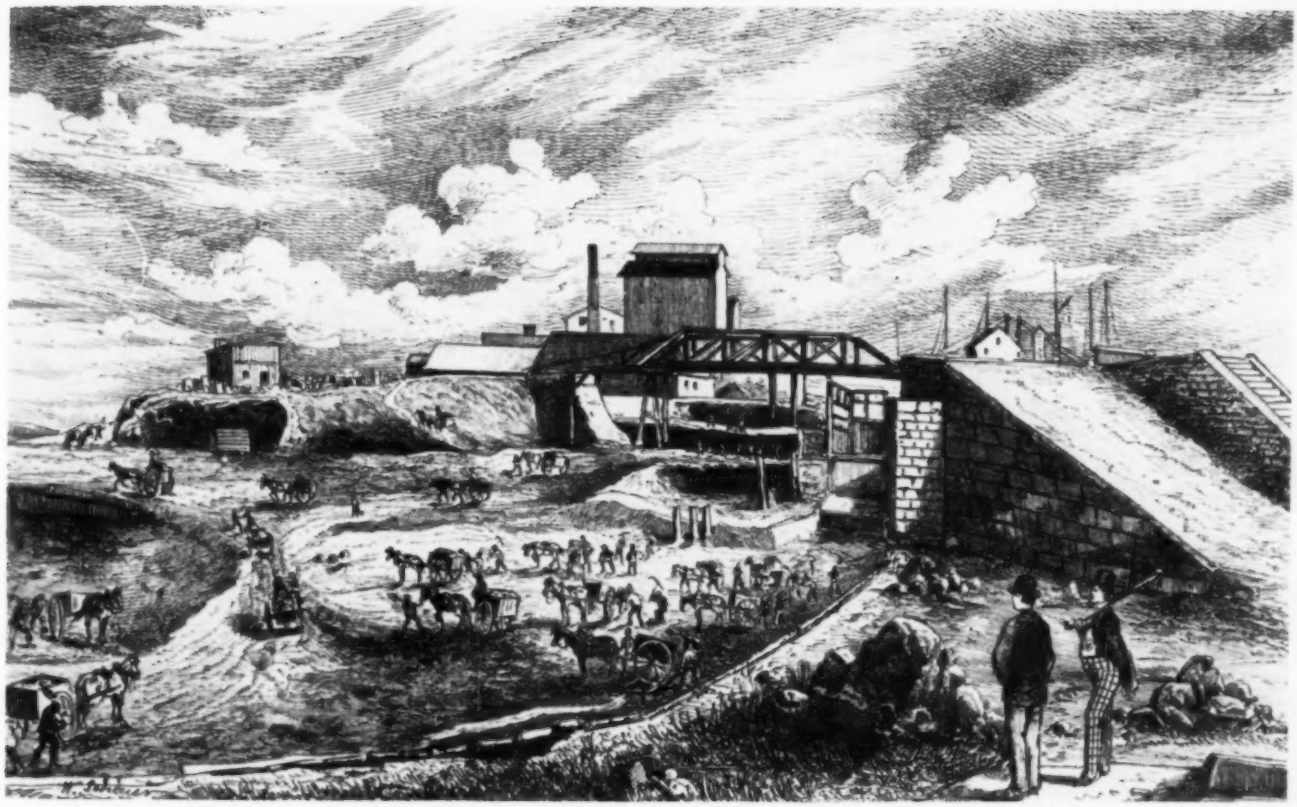
The Ottawa-Rideau canals were constructed on this recommendation and the Trent system was largely based on the route selected in this report. The Duke of Wellington's proposals for other waterways, however, never came to fruition. He suggested a waterway from some point on the Rideau Canal to the Black River and thence into Lake Simcoe. He had plans for another waterway from Lake Simcoe to Lake Erie via the Holland River and a canal connecting it with "La Grande Riviere" (the Grand) and to be linked up with the Thames and the Chippewa. While some of the Duke of Wellington's projects were not feasible, due doubtless to the confused maps with which he had been provided, his report showed that he placed great reliance on waterways as means of communication and transportation.

In addition to Lachine Canal, other main-route canals built over the years included some which were later superseded by others while in other cases the operating canals were demolished in 1958 and disappeared during the flooding of a large section of the International Rapids Section of the St. Lawrence River to form a power pool, known as Lake St. Lawrence as part of the St. Lawrence Seaway and Power project.

As mentioned before, the Royal Engineers built a series of 2½ foot canals between Lake St. Louis and Lake St. Francis from 1779 to 1783. These canals were on the north side of the river and were known as the La Faucille, Trou-du-Moulin, Split Rock and Coteau du Lac Canals. The first two were later replaced by Cascades Canal. These canals were later deepened to 3½ feet. In 1845 they were superseded by the Beauharnois Canal built on the south side of the river to provide 9-foot navigation. Use of this original Beauharnois Canal was discontinued in 1899 on completion of the Soulanges Canal on the north side of the river which provided 15 feet of water on the sills of the five locks. This canal in turn has been superseded by the new Seaway Canal between Valleyfield and Beauharnois on the south side of the river.

The Cornwall Canal was built to by-pass the Long Sault Rapids and extended 11 miles from the then town of Cornwall to Dickinson's Landing. Construction commenced in 1834 and was completed in 1843 providing

Leaving Kingston, Ontario, the first locks on the long climb to the Rideau Lakes are at Kingston Mills. The Rideau Canal was devised by the Duke of Wellington for the defence of Canada after the War of 1812.



Excavating the Lachine Canal in 1821, from a sketch by W. Schruer. Excavation was by pick and shovel work and loading into one-horse carts. Public Archives

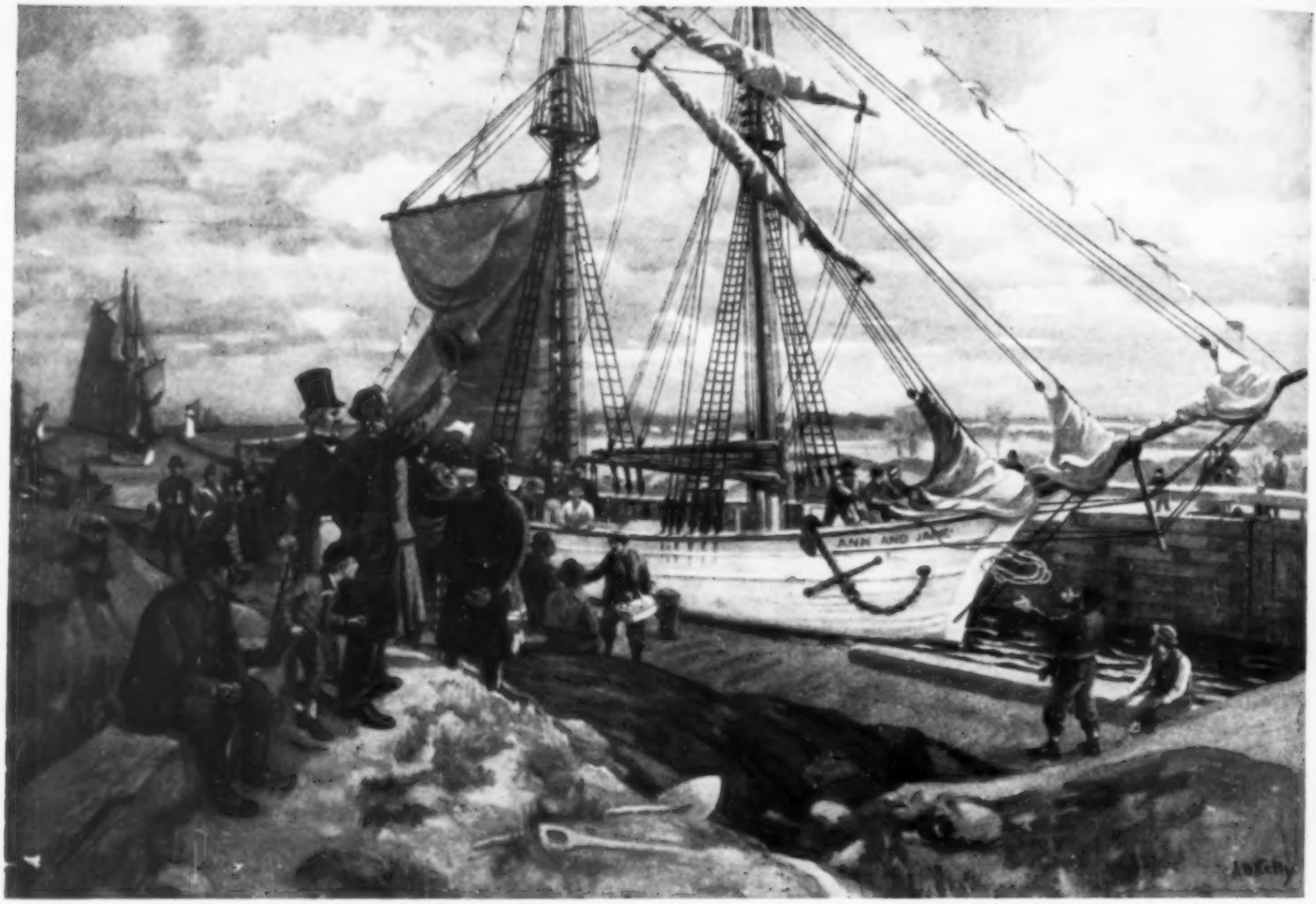
9-foot navigation. By the turn of the century, 14-foot navigation was provided on this canal with most of the locks enlarged. Only the down-stream part of the Cornwall Canal remains as the upper section was cut off by the power dam of the St. Lawrence power development and the equipment and building were razed prior to the flooding of the power pool.

The Farran Point, Rapide Plat and Galop Canals were all commenced in 1844, first providing 9-foot depth, then deepened to 10 feet and, by the turn of the century, to 16 feet of water on the mitre sills. Originally constructed as two separate canals, the Iroquois and the Galop were joined into one canal in 1856. The upper structure of these canals, with the exception of parts of the Galop Canals, were destroyed prior to the flooding of Lake St. Lawrence on July 1, 1958 only a few hours after the last ship had been locked through. The name of the Iroquois Canal was perpetuated with the construction of the new Seaway Canal at the head of St. Lawrence Lake, above the village of Iroquois.

Minor Canals of Canada

As stated before, the Montreal, Ottawa and Kingston water route was originally built on the recommendation of the Duke of Wellington to provide safer lines of communication between Montreal and the new settlements on Lake Ontario in the event of resumption of war with the United States. Happily, that purpose never materialized and instead the route became of considerable commercial usefulness for many years. With development of highway competition on a motorized basis, the commercial usefulness of the canals waned. However, the whole route, particularly between Ottawa and Kingston, has grown in importance from a tourist and recreational standpoint.

Starting from Lake St. Louis on the Seaway above Montreal, this waterway passes into the Ottawa River at the western tip of the Island of Montreal, by-passing the Ste. Anne Rapids by means of the one-lock Ste. Anne Canal. This lock overcomes a three-foot rise in the river and provides nine feet of water at the sills. The original canal to



The opening of the first Welland Canal in 1829, with the Ann and Jane *of Upper Canada being the first vessel to navigate from Lake Ontario to Lake Erie.* Confederation Life

overcome these rapids was built in the western channel at Vaudreuil in 1816 by the St. Andrew Steam Forwarding Company providing a 5-foot depth. In the years 1840 to 1843 the first Ste. Anne Canal was built in the eastern channel by the Board of Works to provide 6-foot depth. This was enlarged to its present 9 feet in 1886.

The Royal Engineers were responsible for building the first Carillon Canal in the years 1825-33 and the first Grenville Canal in 1825 to 1829. Both these canals provided 6-foot depth and were enlarged to 9 feet by 1882. The first named canal overcomes the Carillon Rapids at the head of Lake of Two Mountains and a dam which raises the water level of the river, making it navigable to the foot of Long Sault Rapids which are overcome by the Grenville Canal.

It was near the site of the present Carillon Canal that, in 1660, Dollard des Ormeaux and his 16 companions perished in their heroic and successful attempt to turn back some 700 Iroquois bent on attacking the young settlement at Montreal.

A new power development is being built at Carillon which will necessitate remodelling the Ottawa Canal system. One lock with a lift of 62 feet will replace the existing 7-lock system.

The 123-mile long Rideau Canal, likewise built by the Royal Engineers, took six years to construct and was completed in 1832. Utilizing the Rideau and Cataraqui rivers and a chain of scenic lakes, the Rideau Canal forms one connected waterway from the Ottawa River to Lake Ontario and has not been much changed in the 130 years of its existence. Much of the old stonework still remains at the locks and dams. Ascending the Rideau Canal, the rise from the Ottawa River to the summit level on the Upper Rideau Lakes is 277 feet, requiring a total of 33 locks. From the summit level to Kingston, the descent is 162 feet for a distance of 40 miles and by means of 14 locks.

The Rideau Canal adds greatly to the natural beauty of the Federal Capital of Canada. It commences in a narrow natural valley flanking the Parliament Buildings at Ottawa where eight locks in flight rise from the Ottawa River. Thence it passes through the heart of the city, between walls flanked by boulevarded driveways and past the wide expanses of the Dominion Experimental Farm. At the other end of this scenic canal lies the city of Kingston where the canal drops into the natural channel of the Cataraqui River and into Lake Ontario.

The Trent Canal system, extending 232 miles from Lake Ontario to the Georgian Bay, follows in the main the historic Iroquois Trail, the pathway used by the Iroquois in their deadly descent on the Hurons. It was the route followed by Champlain when he discovered Lake Ontario in 1618 and it also was the route suggested by the Duke of Wellington to provide water transportation to the Upper Lakes. From Lake Ontario to the summit level at Balsam Lake, the rise of water is 598 feet while the descent to Georgian Bay is 262 feet.

The canal began in a small way in 1833 with the construction of a few locks in order to connect the small pioneer settlements along the banks and shores of rivers and lakes. Good roads and motor traffic made inroads in the freight carrying traffic during the 1920's and 1930's but they have also brought about a very extensive development of the route as a holiday and tourist playground in which the canal facilities play no inconsiderable part.

One of the features of this waterway is the world's highest hydraulic lift lock, providing a vertical rise of 65 feet in about seven minutes. Two large chambers, 140 feet long and 33 feet wide, are balanced on two huge plungers working in deep presswells in such a manner that when one chamber is up and opening into the upper reach of the canal, the other is down and opening into the lower reach. Other features of this waterway are the two marine railways overcoming water levels of 47 feet and 58 feet respectively at Swift Rapids and Big Chute on the Severn River between Lake Simcoe and Georgian Bay.

The Richelieu River, Lake Champlain and Hudson River route between Montreal and New York follows the war path of the early Iroquois and of the early whites. Still standing are the well preserved walls and some of the buildings of Fort Chambly, built in those early days of warfare. During the French

The present Canadian lock at Sault Ste. Marie built in 1895, and still used by all but the largest lakers.

regime "portage" roads were built through the dense forests to circumnavigate the rapids on the Richelieu.

The Chambly Canal was built to overcome the long series of rapids which extend from the Chambly Basin to St. Jean. The St. Ours Canal overcomes a retaining dam which provides 7-foot navigation to the lower entrance of Chambly Canal. Water borne traffic on this route is limited by the dimensions of the Chambly Canal locks to vessels not greater than 112 feet long and 22½ feet wide. The depth of water is 6 feet 6 inches at the sills. Lake Champlain provides deep water navigation to the northern terminus of the Champlain Canal in the United States with 12-foot depth and connects with the Hudson River at Troy, the eastern terminus of the Erie Canal, and thence by deep water to New York City.

Canada possesses two salt water canals on the Atlantic Coast. The St. Peters Canal, built between 1854 and 1869 for vessels with a 13-foot draught and later deepened to 18 feet, connects St. Peters Bay on the southerly side of Cape Breton with the Bras d'Or Lakes, the northerly end of which is open to the sea. This route is used chiefly by vessels to and from Sydney, Nova Scotia, seeking a more protected passage than is afforded by the open sea. It proved particularly valuable during World War II.

The other canal in the Maritimes, pierces the Canso Causeway which was built in 1955 to provide highway and railway passage between Cape Breton Island and the mainland of Nova Scotia. The Canso Canal provides navigation for vessels with a draught not greater than 28 feet and a length not greater than 715 feet. The canal is mainly used by coastwise shipping and by fishing vessels.

Three other canals in Canada were built during the last century by the Department of Public Works and are operated by them in connection with other works. One of these cuts through a piece of low land which partly separates Burlington Bay from Lake Ontario and enables shipping to reach the Port of Hamilton. This canal was completed in 1832 and deepened in 1850.

The Department of Public Works also maintains and operates a dam and lock on the Red River at St. Andrews, near Selkirk, Manitoba, by means of which vessels from Lake Winnipeg are enabled to proceed up the Red River as far as Fargo, North Dakota, in the United States. This department also operates and maintains a lock at Poupre, Quebec, which connects two stretches of navigation on the Lievre River. This is mainly used for lumbering purposes.

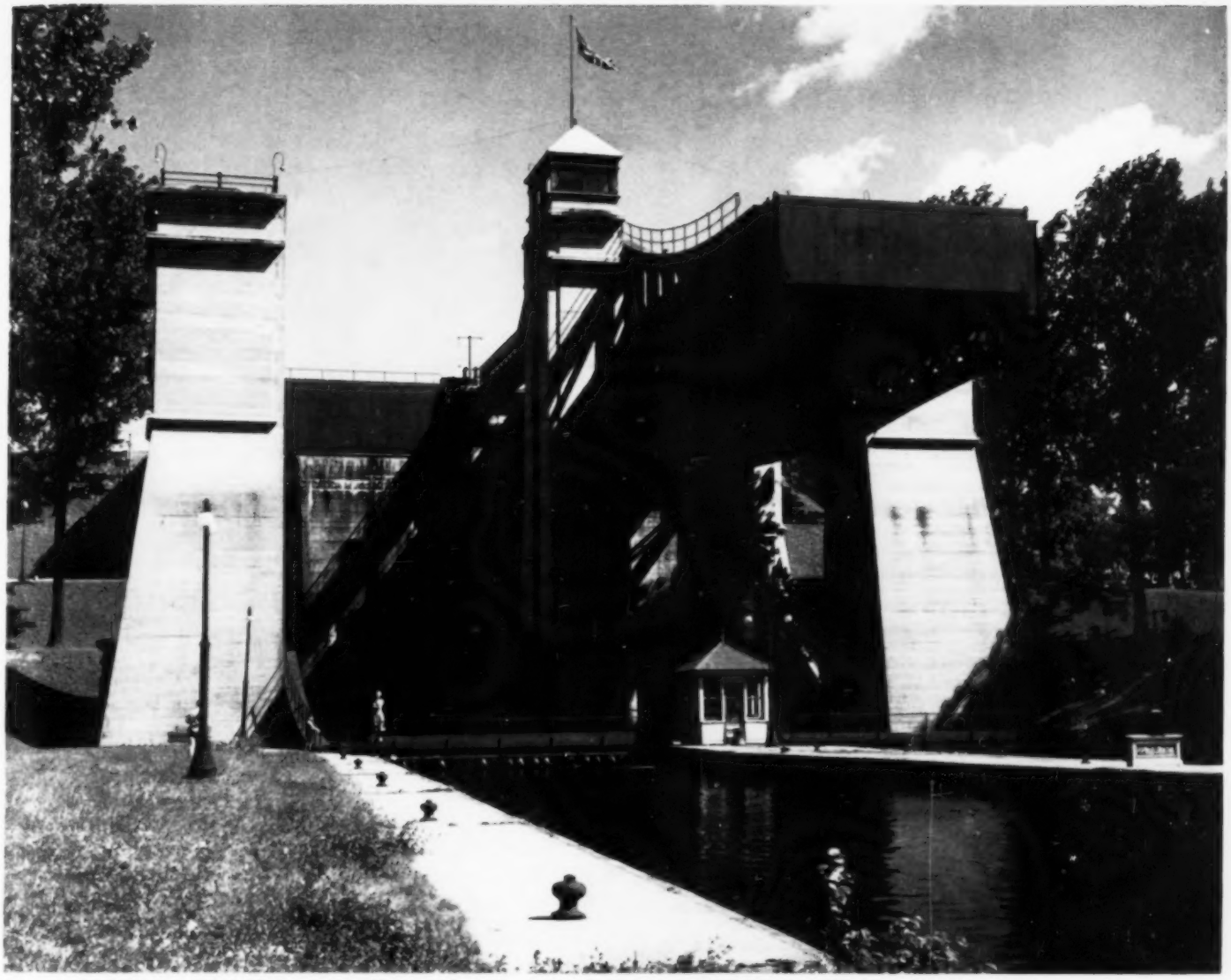
The Ontario Department of Public Works which built parts of the Trent Canal and which operated them before their being taken into the Trent system, also built and still operates three locks which are independent of the Trent system. Two of these are for tourist purposes, one at Port Carling on the Muskoka Lakes and the other at Huntsville. The third lock is on the Magnetawan River and is for the assistance of lumbering operations in the district.

Canals Taken Over by the Seaway

When the St. Lawrence Seaway was completed in 1959, it took over among others, the Lachine Canal which remains in operation for the servicing of industries which have been developed along its banks. Likewise, what remained of the Cornwall Canal after completion of the power dam is used to service City of Cornwall industries located alongside.

The main asset turned over to the St. Lawrence Seaway Authority was the Welland Ship Canal, providing locks to Seaway dimensions and requiring minor dredging which has since been completed to deepen the canal channels. Commenced in 1913, construction of Welland Ship Canal was delayed by World War I and it was not until 1931 that it was opened to navigation. The lift of 327 feet is accomplished by eight locks as against 27 in the 14-foot canals and 40 in the original 8-foot canal. Dimensions of the locks are 80 feet wide and from 859 to 1,380 feet long. All have 30-foot depth of water at the sills. Locks 4, 5 and 6 are twin locks in flight, overcoming the steep rise known as the Niagara Escarpment, and permitting uninterrupted passage of upbound and downbound traffic.

Previous to the construction of the First Welland Canal, all freight had to be transported overland from Queenstown on the Niagara River to the mouth of Chippewa Creek above Niagara Falls. In 1764 a capstan



A feature of the 232-mile waterway between Lake Ontario and Georgian Bay is the world's largest hydraulic lift lock with a vertical rise of 65 feet at Peterborough.

incline was built on the east side of the Niagara River to the top of the escarpment from which a wagon portage, about 6 miles long, was used to carry bateaux and merchandise to the head of the Falls.

The first Welland Canal was built between 1824 and 1829 through the efforts of the Honourable William Hamilton Merritt as a result of which a private company, the Welland Canal Company, was formed. The original plan was to carry the canal by tunnel through the ridge between Port Robinson and Allanburgh and to descend the slope by means of a railway and thence by canal to Lake Ontario. The original plans were changed several times and, when completed, the route of the First Welland Canal was an all-water route, using the valley of Twelve-Mile Creek and the Welland, Chippewa and Niagara Rivers. There were 40 locks with 8-foot depths on sills. The 27 mile long feeder canal from the Grand River had a depth of 5 feet. By 1833, the canal was extended from Port Robinson to Port Colborne.

Full ownership and control of this original canal was assumed by the Government of Upper Canada in 1841 and work commenced the following year on building the Second Welland Canal. This involved deepening the canal to 9-foot depth, the rebuilding of locks, converting the feeder into a navigable canal and building a branch to Port Maitland with an entrance lock at that point. By 1845 this project was completed, reducing the number of locks to 27 and increasing the depth at the sills to 9 feet. In 1853, the depth of this canal was increased to 10 feet by raising banks and lock walls as well as dredging.

The Third Welland Canal made use of many of the existing facilities. By 1883 the summit level was lowered to permit most of the water supply for the canal to be obtained directly from Lake Erie and the depth of the canal was increased to 12 feet. Four years later 14-foot depth was made available to shipping. The Third Welland Canal had its northern terminus at Port Dalhousie, from where the route extended in a southeasterly direction, climbing the escarpment at Thorold, and then generally following the route of the Second Canal to Port Colborne.

Historic St. Peter's Canal provided protected passage for shipping to Sydney, Nova Scotia, during World War II.

During the winter of 1959-60 after one season of operation under Seaway conditions, work was undertaken on the Welland Canal to provide additional tie-up walls to facilitate the smoother operation of traffic. This has proven adequate in controlling traffic during congested periods.

Another canal taken over by the St. Lawrence Seaway Authority from the Department of Transport was the Sault Ste. Marie Canal which overcomes the rapids of the St. Mary River. Built in 1887-1895 almost 73 years after the original locks had been destroyed in the War of 1812, the canal has a total rise of 19 feet and its one lock has a depth of 18.25 feet of water over the sills. The lock is 900 feet by 60 feet and is mainly used by smaller ships or by larger ones when travelling light to the head of the lakes to re-load with grain.

Across the International Boundary at Sault Ste. Marie, Michigan, there are four United States locks, the newest of which, named the "McArthur" has a depth of 31 feet. The four United States locks and the Canadian lock handle a far greater volume of shipping than most other canal systems in the world.

Geographical Changes

The St. Lawrence Seaway which was officially opened on June 26, 1959 by Queen Elizabeth II and President Dwight D. Eisenhower, marked the completion of five years of intensive work which greatly altered the geographical formation of the St. Lawrence Valley between Lake Ontario and Montreal. A lake was created and its waters harnessed, deep navigation channels were dug in record time and new canals were built.

The Seaway project was one of the most ambitious construction ventures undertaken since the Panama Canal and was carried out jointly by the St. Lawrence Seaway Authority in Canada and the Saint Lawrence Seaway Development Corporation in the United States. The new lake, named Lake St. Lawrence extends 40 miles upstream from the power dam which lies across the river from Cornwall, Ontario, to Barnhardt Island, near Massena, New York. Large areas were flooded on both sides of the International Boundary.

On the Canadian side, whole communities had to be moved. No. 2 Highway had to be re-located and 40 miles of the main-line track of the Canadian National Railways had to be re-routed. The rehabilitation programme

Most American water tourists enter Canada via the Hudson River, Lake Champlain, and Richelieu River route. An American craft passes through the Chambly locks, Quebec.

The recently completed Canso Causeway which links Cape Breton Island to Nova Scotian mainland is provided with a navigation canal for use of coastwise shipping and fishing vessels. This scene is at Port Hawkesbury, Nova Scotia.

A disappearing highway in Ontario, caused by flooding of land for the St. Lawrence Seaway and Power project.

involved moving some 6,500 persons along the north shore of the river between Cornwall and Iroquois. More than 550 dwellings were transported to new locations, churches, shopping centres and public buildings had to be erected and new municipalities were created as old ones were wiped out. Concurrent with these developments was the creation of thousands of acres of parklands in the Seaway valley on both sides of the International Boundary, the creation of an Upper Canada Village as a memorial to the United Empire Loyalists, special museums housing scenes of the early settlers. Also given special attention was the location of a pioneer memorial cemetery, preserving tombstones from the ancient cemeteries and representative of every pioneer family identified with the early settlement of the district.

The burning of old shops and office buildings at Morrisburg, Ontario, to eliminate future navigation hazards in the new Lake St. Lawrence.

St. Lawrence Seaway Canals

Proceeding up-river along the south shore of the St. Lawrence River at Montreal Harbour, ships enter the Seaway via a deep channel between dyked walls which commences below Jacques Cartier Bridge. This bridge had to be raised at its St. Lambert end to provide clearance to government specifications of 120 feet for deep draught navigation. After passing underneath this bridge, the channel stretches ahead for about two miles to Lock No. 1 at St. Lambert.

A 15-foot lift is provided to shipping at St. Lambert Lock and at Victoria Bridge, a lift

The largest suction dredge in the world at work in the Beauharnois Canal, Quebec.

span is provided at alternate bridges to give clearance to shipping without interfering with highway traffic. A railway diversion structure, when completed, will offer the same facility for rail traffic. From St. Lambert Lock, ships proceed via a 10-mile channel leading to Cote St. Catherine Lock where ships are lifted 30 feet to the level of Lake St. Louis. Along the channel leading to the lake, ships have to pass Honore Mercier Bridge

The construction of the 80-foot wide chamber of the Cote Ste. Catherine Lock at Lachine Rapids to Seaway standards.

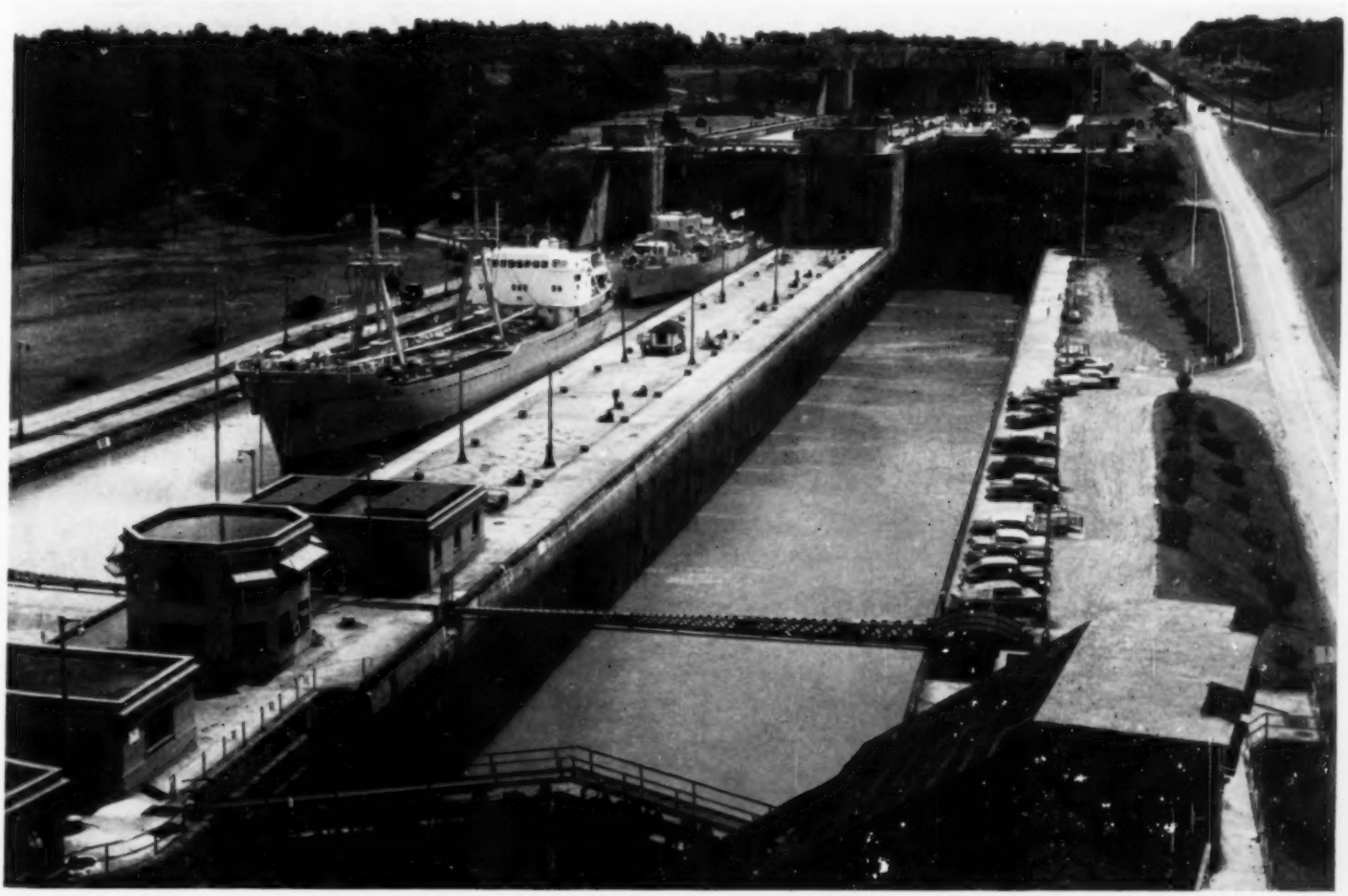
St. Lawrence Seaway Authority

The Honore Mercier highway bridge and the Caughnawaga C.P.R. railway bridge, two of four bridges across the St. Lawrence River at Montreal which had to be modified to provide 120-foot clearance over the Seaway canal.

The Eisenhower Lock, the most westerly of the two United States locks on the Seaway, built near Massena, New York. The lift of this lock is 38 feet.

The Iroquois Lock at Iroquois, Ontario, the most westerly of 7 new locks built for the Seaway. Provision has been made for twinning this lock at some future date if traffic warrants it. On the right is the Iroquois Dam.

The modern Welland Canal, showing twin locks in flight. Eight locks provide 320-foot lift to overcome Niagara Escarpment.



which was raised to clearance requirements and a railway bridge provided with two lift spans for the double tracks.

Navigation through Lake St. Louis is provided along a well-marked 27-foot channel for about 14 miles to the Beauharnois Canal. This is the power canal which has been enlarged to Seaway requirements. Two locks raise ships 42 and 40 feet respectively to overcome the 82-foot rise to the level of Lake St. Francis. Ships proceed along the 16-mile power canal, passing three bridges which have been re-modified and reconstructed to permit passage of both shipping and road and rail traffic. Under the Beauharnois Canal, a tunnel has been constructed to accommodate highway traffic.

After clearing the Beauharnois Power Canal at its upper end, ships navigate the 27-foot channel through Lake St. Francis to Cornwall Island where they enter international territory. Leaving Canadian waters, ships proceed along the south side of the river in United States waters to the Bertrand H. Snell lock, the first of two locks built as part of the Seaway project by the Saint Lawrence Seaway Development Corporation of the United States.

The Bertrand H. Snell Lock provides a 49-foot lift which leads into the Wiley-Dondero Ship Channel near Massena, New York. This channel is 10 miles long and towards its western end is located the Dwight D. Eisenhower Lock, also built by the Corporation and providing a rise of 42 feet to the level of Lake St. Lawrence. This man-made lake is a power pool created by the main power dam between Barnhardt Island and the Canadian mainland above Cornwall, and the Long Sault Dam between Barnhardt Island and the United States mainland.

Approximately 25 miles up-river is located the Iroquois Lock on the Canadian side of Lake St. Lawrence where ships are lifted from the power pool into the upper river. It is at Iroquois that the water level of the power pool is controlled by a large dam located partly in Canada and partly in the United States. Once above Iroquois, ships traverse dredged channels through the Thousand Islands section into deep waters of Lake Ontario. At the upper end of this body of water, ships are lifted up the eight locks of the Welland Ship Canal to the level of Lake Erie, a rise of 320 feet. No structural alterations have been made to the Welland Canal locks but the canal's 28 mile length has been dredged from a previous 25-foot depth to Seaway requirements of 27 feet.

Operational System Unique

Inasmuch as entry to the Seaway both at the St. Lambert Lock at Montreal and at the Welland Canal in the Niagara Peninsula is in Canadian territory, the task of operating the Seaway system for the regulation of traffic has, to a large extent, been allotted to Canada. The Seaway Regulations, made by the St. Lawrence Seaway Authority, have also been approved by the Saint Lawrence Seaway Development Corporation where applicable to the United States.

The whole operational system of dispatch was devised by Canadians experienced in the handling of traffic under the former all-Canadian main line route from Montreal to the head of the lakes. The operational system devised by Canadians and approved by United States authorities is unique in many ways and is totally different from those in force at the Panama, Suez, the Rhine River and other important canal systems.

D. M. Mackenzie, General Superintendent of Operation of the St. Lawrence Seaway Authority with headquarters at Cornwall, Ontario, expressed the opinion that the ship despatching system devised for Seaway operations is one of the simplest in the world and after practically two years in operation is proving very satisfactory. He praised the Seaway staff for able handling of traffic under this system and expressed the opinion that most of the Masters and Officers of ships using the Seaway are now well conversant with the system and co-operating in making it effective for the smooth operation of traffic.

Under the Seaway ship dispatching system and in order to avoid stopping or delaying vessels for documentation and toll collection, a ship's agent or representative is required to fill out necessary documents in advance of the ship's arrival and obtain pre-clearance from the Authority. The number given to the ship is then quoted in all ship-to-shore telephone conversations as the vessel receives its

instructions at the different calling-in points.

For upbound ships, the calling-in points are located at the town of Varennes, 12 miles downstream from Montreal Harbour; the entrance to the Seaway dyke close to the Jacques Cartier Bridge at Montreal; Windmill Point on Lake St. Louis; Hamilton Island Light on Lake St. Francis; Raquette River Range on Lake St. Francis; MacDonald Point on Lake St. Lawrence; Robertson Point on Lake St. Lawrence; and three miles off the entrance piers at Port Weller on the Welland Canal.

For downbound ships, the calling-in points are located off Port Colborne Harbour, Lake Erie; Maitland on St. Lawrence River; Sparrowhawk Point on the St. Lawrence River; Bradford Island on Lake St. Lawrence; Richard's Point on Lake St. Lawrence; Pointe Mouillée Pier Light on Lake St. Francis; entrance to Beauharnois Canal; Lower Beauharnois Lock when leaving; and the Seaway dyke at Montreal where the ship leaves Seaway control and enters Montreal Harbour control.

Despatchers are located at Beauharnois Lock, Eisenhower Lock, Iroquois, Welland Canal and the Canadian Sault Ste. Marie Canal. The despatchers give instructions as to anchoring, tieing up or locking through the canals under their respective jurisdiction and at each lock ships are guided in by visual signals operated by the lockmaster.

Larger-type pleasure craft are permitted to use the Seaway but are required to be precleared before departure from their respective home ports. Payment of tolls is by purchase of tickets purchased in advance and pleasure boat owners are required to tie-up before entering a lock and proceed to the lockmaster's office where a ticket will be surrendered and verbal instructions obtained.

Smaller pleasure craft, of less than 20 feet overall length or two tons in dead weight are not permitted to pass through the St. Lambert, Cote Ste. Catherine and Beauharnois locks at the downstream end of the Seaway, or at the Welland Canal at the upstream end between Lake Erie and Lake Ontario. Smaller craft may however use the Lachine Canal and may enter the Seaway by means of the Rideau Canal, the Trent Canal or by the canals in the United States. They may proceed from Lake Ontario as far downstream as the foot of Lake St. Francis.

All rules and regulations which are enforced while in transit through the St. Lawrence Seaway or through other canals and waterways have been devised with a view to speeding up passage of commercial vessels and to provide for the safety of all shipping. They are also devised to provide the least inconvenience to pleasure vessel owners. In addition to enforcing "Rules of the Road" and other regulations on Canadian waterways, the Department of Transport is also carrying on a campaign to educate the boating public of Canada on necessary precautions to ensure their safety and the safety of others.

Canada has a rich heritage in her waterways and has used her endowment with wisdom and efficiency in developing avenues of travel and trade. This heritage is also enjoyed by thousands of pleasure-seekers, young and old, who are answering the call of adventure on the canalized waterways and the open stretches of inland lakes.

Under the Seaway ship despatching system, ships tie up awaiting go ahead signal from lock operator.

The stone fireplace was a vital part of the pioneer's home. This one in the 1816 house in the Pioneer Village was used for cooking and had a built-in bake oven. Cooking herbs grown in a nearby herb garden are hung to dry above the fireplace. At extreme right is a settle bench dating from about 1820.

Edgeley—A Pioneer Village Reconstructed

by JOHN GRIMSHAW

Photographs by Gilbert A. Milne.

DURING the past five years, an ancient but durable-looking barn located in the farming district which hugs the north-western edge of Metropolitan Toronto, has become a point of interest for tourists, school students and even jaded residents of the city.

Within the 152-year-old barn is housed a veritable treasure trove of equipment, furniture, furnishings and farm implements many of which are unique on the North American continent.

This is the Dalziel Barn which stands on part of the Black Creek Conservation Area at Jane Street and Steeles Avenue.

Even without the artifacts that it accommodates within its hewn-timbered walls, the Museum provides an interesting link with the pioneer farming days of yore in the district.

It was built in 1808 by Johannas Schmidt, a Pennsylvania German farmer who came to Canada to settle. He built a two-storey log house, a log barn (the Museum), and a sawmill.

Twenty years later, John Dalziel sailed to Canada from Lanarkshire, Scotland, with his wife and nine children, and purchased the property and buildings from Schmidt.

The first night in his new homestead, John Dalziel read the 14th verse of the 132nd

An exhibit of maple sugar-making equipment in the Dalziel Barn museum, containing a sled for transportation of the sap tank, oxen yoke, burl dipper, skimmer, large iron pots, sap buckets and maple sugar moulds.

Psalm from the family Bible: "This is my rest forever; here will I dwell for I have desired it".

Some of his descendants continue to live on part of this land.

The magnificent barn structure measures 82 feet long and 30 feet wide. It is built with foot-thick, hand-hewn pine and oak timbers and stands as an enduring monument to the skill and enterprise of its builder.

The barn was restored by the Metropolitan Toronto and Region Conservation Authority following the purchase of the property as a conservation area. The site also

Some of the buildings which comprise the Pioneer Village are show here. The fenced-in area is a herb garden. More than 25,000 persons have already visited the Village which was opened in June. The Village is located about a quarter of a mile south of the museum.

A girl's bedroom in a settler's second house contains her five dowry pieces — bed, chair, table, blanket chest (left) and clothes press. A hand-woven coverlet is on the bed.

includes demonstration plots, a farm pond, picnic facilities, cookhouse, outdoor fireplaces and toilets.

Within the Dalziel Barn, the visitor finds himself transported back 150 years in history, and here he may re-create the everyday living habits of the pioneer settler.

Among the many exhibits to be found in the museum are: a farm woodworking shop with an assortment of cooperage tools, carpenters' equipment, patterns, bench and lathe; flax processing, stump pulling, agricultural, ice cutting, meat processing, buttery, spinning equipment and small archives. There is also a maple sugar bush scene created by a painted backdrop depicting outdoor maple sugar making, and in front of it stands a large sled for carrying the sap tank, oxen yoke, burl dipper and skimmer, large iron pots, sap buckets and maple sugar moulds.

None of the equipment displayed at the Museum is later than 1850. The exhibits graphically illustrate the ingenuity and originality of the pioneer farmer. Everything he required for his daily living had to be fashioned from the materials at hand. Only wood was abundant to the farmer in those early days, and thus it can be seen from the equipment displayed how wood was utilized to provide the comforts and necessities of the day.

Nearly all of the objects housed in the museum have been donated by the people of the region.

The Museum, however, is now sharing the spotlight with the Edgeley Pioneer Village

Making sauerkraut in the back kitchen of an artisan's house, built about 1850. Cabbages were cut fine and then pounded in a wooden bucket. Large crock on bench was used for storing sauerkraut while smaller jugs contained vinegar and other liquids.

This century-old still serviceable printing press was donated to the Metropolitan Toronto and Region Conservation Authority by Edwin A. Brown of Woodbridge, Ontario. Mr. Brown's daughter, Mrs. W. Myers, is seen here with Albert Colucci, Director of the Pioneer Village, and Werden Leavens, chairman of the Authority's printing committee.

which is currently under development on a 56-acre farm which forms part of the Black Creek conservation area.

The Village is being developed as an authentic, cross-roads pioneer settlement of about 20 buildings. Dedication ceremonies were held on the site early in June of this year.

Already there are 11 buildings on the site. These include the original log house built on the farm by the Stong family in 1816, a smokehouse built in 1820, a village blacksmith shop and an early 19th century emporium or general store. The village also boasts a Conestoga wagon in excellent condition.

When completed, the village will utilize equipment from the Museum to interpret and re-create the manner in which the early farmers lived. It will also contain such structures as a church, manse, homes, hotel, piggery and school. There is also a century-old cemetery on the site, known as the Town Line Cemetery.

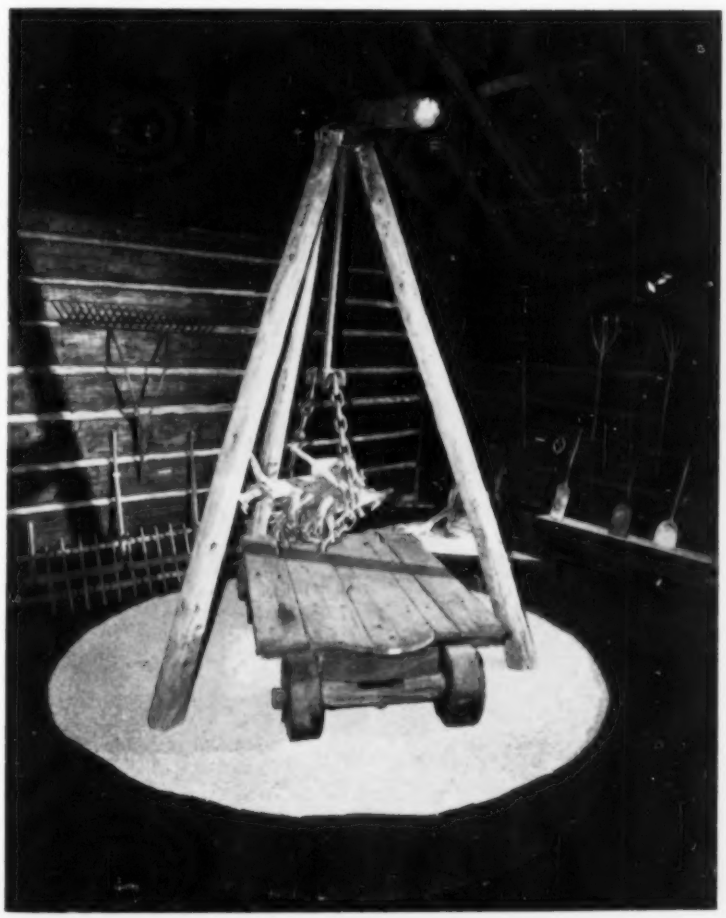
The village site was originally settled by William Stong and his wife, Elizabeth, who came to Edgeley in 1815 with other Pennsylvania German families.

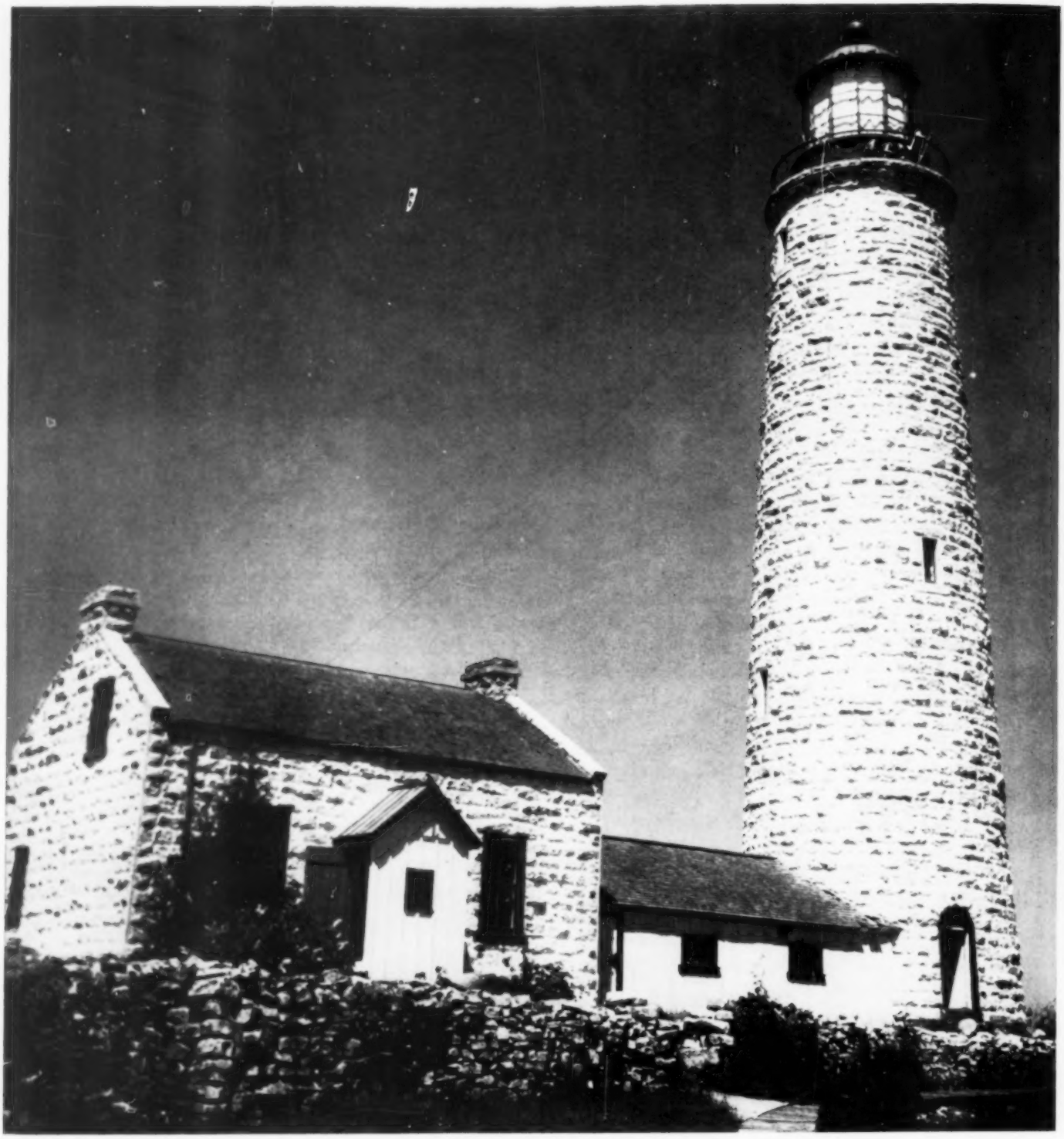
The early land grants in this area were equally distributed between the Queen's York Ranger, church reserves, Pennsylvania German settlers and Scottish settlers. The latter two groups received some Crown grants, but for the most part they purchased the lands from the Queen's York Rangers.

The Stongs obtained a Crown grant and developed a 200-acre farm which remained in the family until 1935.

When the project is completed, an authentic link with the early 19th century will be fashioned within a few miles of bustling 20th century Metropolitan Toronto.

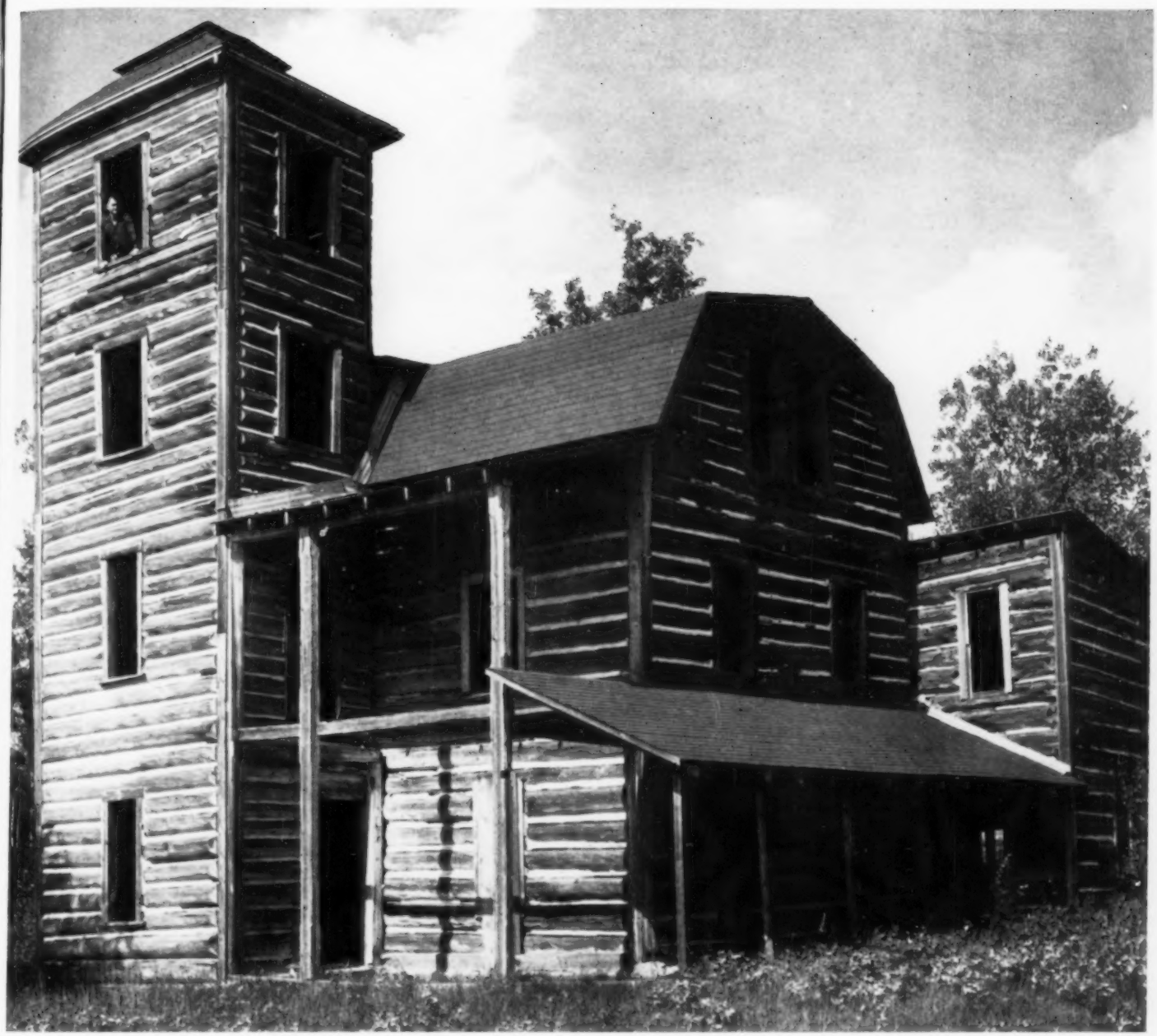
One of the interesting exhibits in the Dalziel Barn museum is this pioneer hand-hewn stump puller and cart. Various farm implements may be seen in the background.





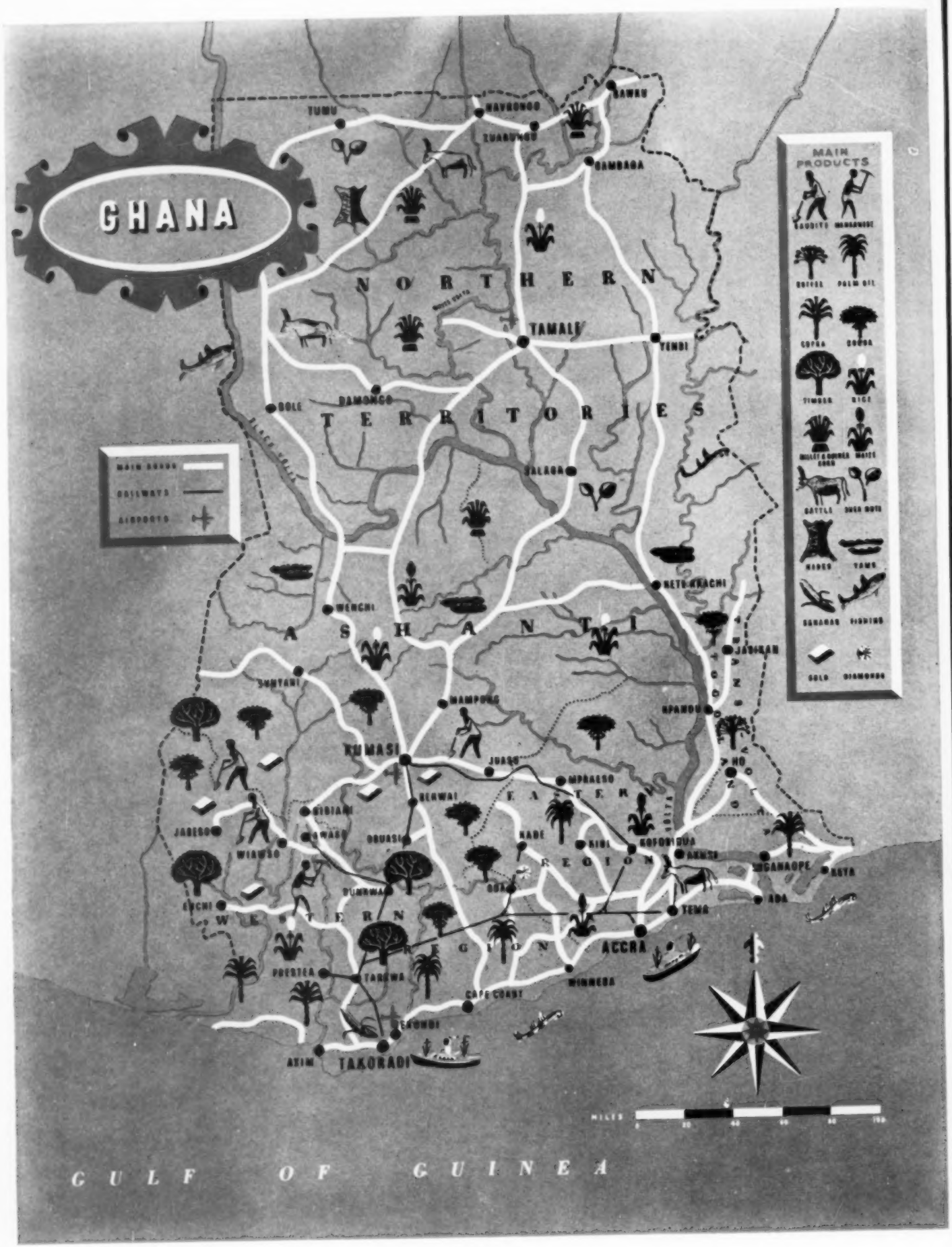
Pictures of the Provinces—XXV

The lighthouse on Cove Island which lies off the tip of Bruce Peninsula, Ontario, between Georgian Bay and Lake Huron. It was built before Confederation, and is constructed of granite brought over from Scotland. The keeper's house beside the tower is built of the same material. Adelaide Leitch



"Wilderness Castle" is the name given to this four-storey log structure on the shore of White Otter Lake, south of Ignace, in northern Ontario. It was built by James McQuaig, a Scottish trapper, who lived here alone for over twenty years. The building was re-roofed and strengthened in 1955 by the Ontario Department of Lands and Forests. It is accessible by canoe or aeroplane on pontoons and is one of the few remaining buildings in what has been designated as a "wilderness area".

Richard Harrington


GHANA
NORTHERN
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SAWLA
TUMU
WAVRONGO
ZUARUNGU
GAMBAGA
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WENCHI
SUNYANI
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KETA
ADA
TEMA
AKIM
MAIN PRODUCTS
MAIN ROADS
RAILWAYS
AIRPORTS
MILES
GULF OF GUINEA

Ghana—Colony To Republic

by PHILIP STUCHEN

Photographs by Ghana Information Services (Accra) except where credited.

THE YEAR 1960 will indeed be a memorable one in African history on several counts. To the fore will be the realization of some fifteen countries with an estimated combined population of about 75 to 80 millions, or approximately a third of the total African populace, in having attained their independence. In fact, others similarly on the books for early 1961 will leave from that date less than twenty per cent of all Africans as non-self-governing; this is in striking contrast to twenty years ago when except for less than one per cent of its people Africa was regarded as one vast colony. Undoubtedly the most potent single factor in rendering colonial status so out-moded and in such short order has been the declaration of independence by Ghana on March 6th, 1957, followed by her subsequent proclamation as a republic within the Commonwealth on July 1st of this year.

A most apposite observation on this trend made by Prime Minister Macmillan of the United Kingdom to the members of both Houses of Parliament of the Union of South Africa on February 3rd, 1960, after his tour of Ghana and other British territories bears repetition (since it, too, will go into the history books): "The most striking impression I have formed since I left London a month ago is of the strength of this African national consciousness. In different places it takes different forms but it is happening everywhere. The wind of change is blowing through this continent and whether we like it or not this growth of national consciousness is a political factor we must all accept. It is a fact and our national policies must take account of it."

That Ghana has within the brief interval of forty months, from March 6th, 1957, to July 1st, 1960, moved from colonial to dominion to republican status has directed much attention to the social changes, the economic advances as well as the political evolution within her borders. Being the first of the black African territories to achieve recently complete autonomy means that she has set a pattern and a pace which is being emulated in other parts of the African continent. It is a further fact that world-wide regard has been directed to the identity of the "African Personality"—an expression which might be credited to President Nkrumah of Ghana—and which essentially means the recognition of the black African within and outside his own domain.

It follows then that there should be considerable outside interest in Ghana, its people, its progress to date, its potential and future prospects. Perhaps one might be permitted to make partial answer to these queries from personal observations. On being asked by Canadians of my impressions after a recent fifteen months' assignment there, I have replied in this fashion: if I had my choice of a week's respite from the Canadian winter —and even the most loyal Canadian often longs for such—I would settle for the first week of March and travel to Ghana. In part I would be lured by the tropical clime which results from the country's location between the fifth and eleven degrees latitute north of the equator. I would have visions of some of the finest beaches in Africa interspersed with shady palm trees and extending along the Gulf of Guinea for some 350 miles. I would be eager to revisit the interior of the country travelling away from the coastal belt on excellent roads over a variety of low hilly country, through the jungle or forest belt in the central portions and, finally, to the dry savannah area of the North. Incidentally, too, the trip, the equivalent distance from Montreal to Hamilton, can be made in one day's travel.

In addition, I would be anticipating my fill of choice pineapples, coconuts, bananas or the unique local dish, ground-nut stew, which has become a Saturday noon-day specialty. I would be anxious to discover new humorous sayings and biblical quotations on the 'mammy wagons' or motor passenger lorries which furnish one of the colourful sights in the country: such sayings painted on front and rear of these lorries as 'The Lord Is My Shepherd—I Know Not Why' or 'As Above So Below' cannot fail to brighten your

travels. But above all these physical and material delights would be a re-union with some of the best-natured and friendliest people in the world—six million (according to a current census) of them living in an area equivalent to the United Kingdom or the three Canadian Maritime Provinces combined. These, then, are a few reasons why I would select Ghana as my place of refuge.

And why this retreat during the first week in March you may ask ? Simply because the good-humour and gaiety of the local folks reach a maximum during the independence week celebrations. A festive spirit combining the language and music of their talking drums, the lively tunes and songs, the colourful tribal and "high-life" dancing along with a serious note of appreciation for the advent of independence dating from the stroke of mid-night, March 6th, 1957, seem to take hold of all the inhabitants. From the remote villages in the north to the fishermen's coves in the south, from the cocoa farmers in the central regions to the lumbermen and miners in the west, the people rejoice and are jubilant.

Perhaps it might be well for the visitor to remain in Accra, the capital, during the celebration activities. This fast-growing city of close to a half million population, as well as being rapidly modernized and improved, takes on a new look with its lavish display of flags, banners and festoons. Of interest, too, is that the national flag is appropriately brilliant combining three horizontal stripes: one of red which represents those who worked for independence, one in gold for the wealth of the country, and the third green for the forests and farms with a five-pointed lodestar (the lodestar of African freedom) in the centre of the gold stripe. Thousands of coloured electric lights are strung along the main thoroughfares as well as around the residences of prominent citizens. Agricultural and industrial displays and demonstrations are set up in an open square in the centre of the city and are visited by the curious and holiday-minded alike.

A fitting likeness in bronze of President Kwame Nkrumah stands at the entrance to the National Assembly. The high regard in which he is held by his people has resulted in streets being named after him as well as coins and postage stamps bearing his portrait.

Other diversions include tribal dancing which is repeated daily along with tuneful band concerts rendered by the fine Police Band. Inter-city soccer matches are fought out with the same sportsman-like rivalry which might characterize a football game between Ottawa and Toronto teams. An inclusive parade of all groups of citizens and workers from the mammy women or market traders to the thousands of school-children in their resplendent khaki or blue uniforms swells the attendance at the Accra Stadium to nearly 30,000. The unique formations and athletic displays put on by the children or the feats of skill executed by members of the armed forces win the crowd's cheers and applause.

In addition, there are the highly contested and equally exciting boat and canoe races sponsored by various fishing villages and commercial firms with as much at stake for the local fans as the Britishers have for the Oxford-Cambridge race; the popular and well-attended horse-racing meets where pari-mutuel machines permit the only bet on a horse to win (and not as we are accustomed to place and to show as well); incidentally, too, where white female riders race against white and coloured male jockeys in an open test of skill; the final selection of a "Miss Ghana" from the several regional winners vying for the signal honour of competing

Accra, the fast-growing capital with half a million population is taking on a very modern appearance with a variety of new governmental, commercial, and diplomatic buildings. Here Kwame Nkrumah Avenue, the main thoroughfare, indicates that trend as well as the increasing ratio of vehicles to the country's total population of over six million persons.

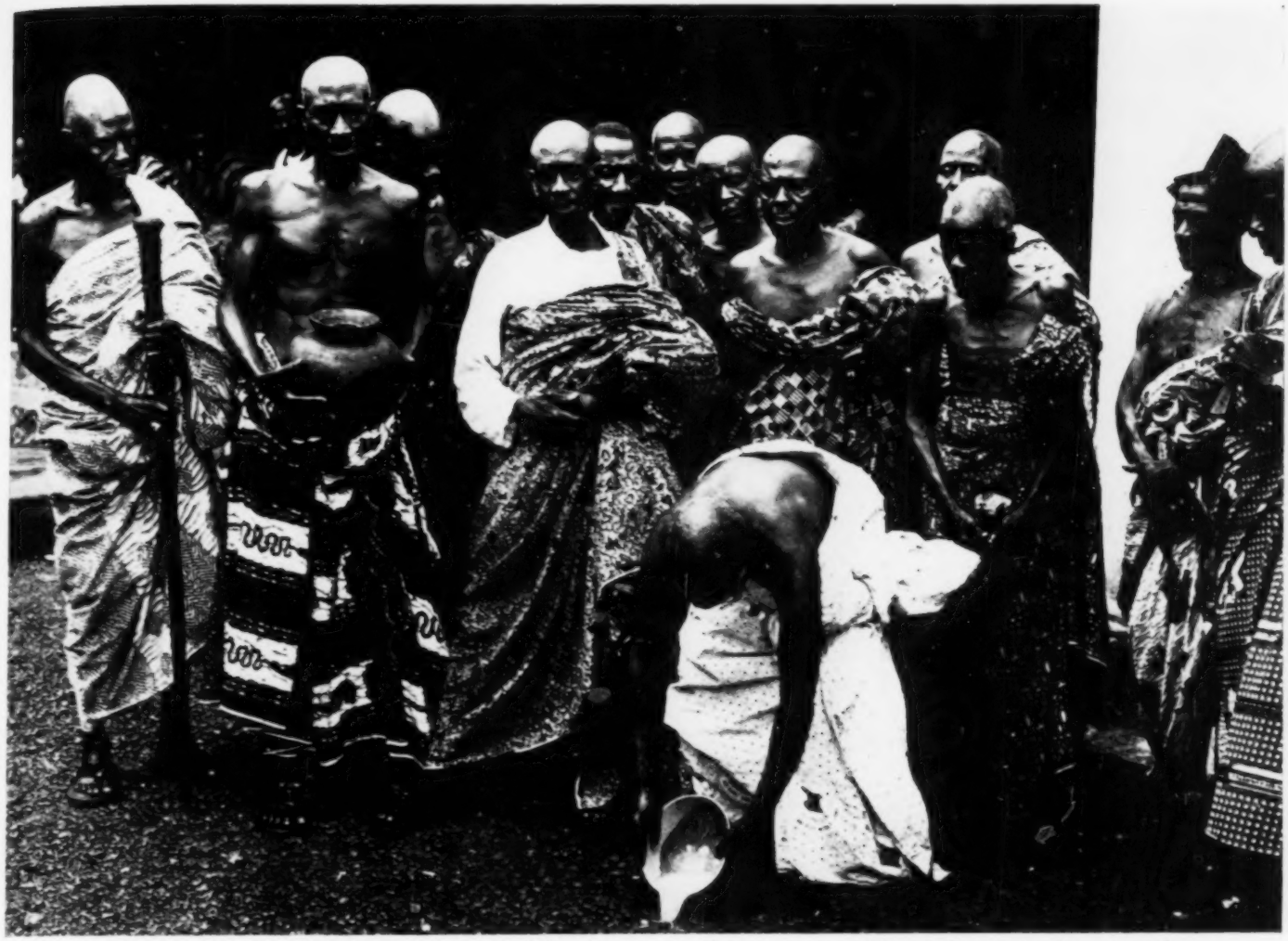
further in the world beauty contest; or the torch-bearing masses parading through the streets of Accra to the memorial arch bearing the words "Freedom and Justice" and which to all symbolizes the struggle for and the achievement of independence.

At the same time we have the official receptions and private parties that form a part of these functions; the spectacularly-dressed chiefs and paramount chiefs in their traditional kente cloth robes and fittings with their retinue in attendance at these affairs; the constant beating of the drums and the echoing songs in the air rendered in the several vernaculars or phonetic tongues—Twi, Fante, Ga, Adangbe, Dagbani and Hausa—as well as in the universally-understood and officially-used English; the final evening's celebration marked by a dazzling fire-works' display which is climaxed by an image of the President's profile portrayed in the illuminated sky for some seconds—these are, then, some of the festivities which I have experienced during Ghana's second independence week and which have left an everlasting impression on me.

While these gay and colourful diversions typify the Ghana of today, they have by no means wiped out the reminders of the earliest colonial times. It suffices to say that the inhabitants are believed to have migrated more than 700 years ago from the ancient empire in the northern interior of Africa and from which the present name of Ghana was derived. It is further recorded that the Portuguese traders in 1471 were the first to discover her gold, actually described as alluvial deposits on the beaches, and which resulted in the country being henceforth identified as the Gold Coast of West Africa. Soon the coastline was a chain of fortifications for traders and adventurers from Denmark, Sweden, Britain, France and Holland. Incidentally, of the 30 to 40 castles and forts built by those competing European powers for the purpose of trade and defence, eighteen are still in a good state of preservation and occupancy: an interesting castle at Cape Coast, for example, houses the local municipal offices while Christianborg Castle in Accra built by the Danes in the 17th century and the best preserved was until recently the residence and office of the Prime Minister. Thus it was over the centuries that bountiful

A colourful gathering of people at a Ghanaian chief's house for the Adai Festival. Here drinks are being offered to the people, the presentation being made through the linguist holding the staff of office. On official occasions, the chief has to speak and be spoken to through the linguist, usually appointed for his eloquence.

Drumming, to relay words or music is one of the country's great attractions, and can be solemn or joyous befitting the occasion. Here, drummers perform at a festival.



The pouring of a libation on occasions of thanksgiving and rejoicing is still a much practised custom. A libation is being poured to the Ancestral Spirits whose continued help and protection is being sought.

Tribal dancing differs from tribe to tribe and from occasion to occasion. In this colourful gathering men and women dance merrily to throbbing drums.

cargoes of gold dust and ivory tusks left these shores; more profitable shipments of slaves—as many as 10,000 annually when the trade was indicated to be at its peak about 1750—were exported until early in the nineteenth century.

It should be realized that in Ghana as in other emerging parts of Africa today, one of the strongest unifying influences, anti-colonialism, has been removed with the coming of independence. The tribal differences, the sectional rivalries, the other latent variants of culture and language now come out into the open; to try and impose some new unity of purpose is not at all easy. To illustrate, daily news over the Ghana Radio is given in the six dialects already mentioned as well as in English; the B.B.C. news broadcasts were eventually discontinued after independence on the grounds that world news should be told in a thoroughly local or Ghanaian context.

Perhaps a more apparent condition of change to the outsider has been the appearance of the "educated African". By his exposure and experience derived outside his native Africa or by his contacts and education received in Western countries, something new has been added—perhaps superimposed is more correct—upon his own original primitive system and customs of tribal living. In this light should we appreciate the fact that the power which certain African political leaders claim today has evolved from a dual source: they enjoy the kind of reverence whicl the tribal chief enjoyed—and still holds in some measure—in traditional African society; but there is also the new type of authority displayed by those who have mastered our political techniques for achieving power by soliciting popular support. One can hardly disagree with a recognized authority describing the new political leaders as one more generation of educated Africans who have learned skills from the West and have applied them (or as some critics would say mis-applied them) to their own environment.

Even before he assumed his rôle as Prime Minister of Ghana, and subsequently as President, Dr. Kwame Nkrumah had warned in his autobiography: "No people without a government of its own can expect to be treated on the same level as people of independent sovereign States. It is far better to be free to govern or mis-govern yourself than to be governed by anybody else." More recently he has asserted that the independence of Ghana will be meaningless unless it is linked with the total liberation of Africa. He, as a prominent figure in his own and in this continental liberation movement, can be perhaps more easily understood when he confesses to his people that he no longer belongs to Ghana, but to all Africa. Truly, a new set of conditions and problems typical of the growing nationalism and anti-colonialism must be recognized, accepted and as Mr. Macmillan cautioned, taken account of.

By her declaration as a republic on July 1st but remaining within the multi-racial Commonwealth, has Ghana shown her eagerness for political innovation. This move arrived at by a referendum vote of her people in April of this year and their acceptance as a republican member confirmed by the Commonwealth Conference of Prime Ministers in May, is not to be construed as a declaration of hostility or intolerance towards whites, or in particular, towards the British. In fact, with a non-African population in Ghana of an estimated 10,000 to 12,000 (of whom half would be British), there have never been the inter-racial tensions or incidents which are common to the other parts of Central and East Africa where the white settlers do exist in substantially larger numbers. Rather does it mean—at least to certain observers who have lived in

Poultry-raising is being carried out on a scientific and productive basis, particularly near Accra. Cattle-raising is also becoming more important in an effort to diversify agriculture.

Plantain sellers at a local market. Larger and more starchy than bananas, plaintains are a popular food, and are often served sliced in half and fried over little charcoal fires in the market or at street curbs.

this country—a strong desire on the part of the Ghanaians to assert their identity and to express themselves in terms of their African personality.

Coincidental with this intention is the hope to move in the direction of a United States of Africa in the true and declared spirit of Pan-Africanism. Ghana has led the way not only in this fight for independence but is already seeking alliances with other countries as they become independent (as in the case of Guinea in late 1958). Also there is the attempt to work out a united policy for the free continent of Africa through particular consultations begun with Guinea and Liberia in early 1959 and by the more publicized and inclusive all-African conferences held on three or four specific occasions since 1956 by the dozen countries which have become autonomous following the last war. That this trend will make for a new set of conditions, problems and even rivalries among the several emerging countries is being ventured in many quarters. It could be, too, that this latter contest will be rendered all the more competitive because of the differing backgrounds

Peeling pineapples by hand for canning. Plans for more extensive and mechanized canning plants for fruits, juices, and fish are being considered.

of the several aspirants—their race, language, tribal and colonial influences, ideology and environment.

But if the political pattern is something that will have to be defined on an individual or a regional basis—and this will undoubtedly require years of trial and error and compromise—there are more apparent evidences of extensive physical change and modernization, considerable economic and industrial development. It is obvious that, especially for newly independent countries, rapid economic development is both a necessity and a problem. While lacking in the usual industrial initiative and know-how and being desperately short of trained administrators and technicians at all levels, yet the accomplishments in three short years of independence in Ghana have been most gratifying and by some standards, even spectacular.

The explanation lies mainly in the fact that Ghana is not exactly a poor country, as so many under-developed countries are classified in terms of their natural resources and industrial potential—or their lack of both. Actually she is considered the second wealthiest country south of the Sahara next to the Union of South Africa. Before World War II Ghana produced one-half of the world's supply of cocoa; today she still manages a third of the total requirements. Her mineral wealth from whence came her earlier name has been long known; she still ranks among the foremost gold producers in the world, presently about fourth. She is the second or third largest producer of industrial diamonds by quantity and the third largest producer of manganese ore. Some of the most extensive bauxite reserves in Africa totalling over an estimated 200 million tons exist between two or three locations within Ghana. Further, timber wealth has been reflected in the country's heavy exports of tropical hardwood logs and sawn lumber over recent years. In round average figures Ghana exports annually about 300 million dollars worth of minerals and primary products, cocoa constituting about two thirds of the total and the balance being almost equally distributed between gold, lumber, diamonds and manganese shipments.

Like so many other countries which have reached nationhood Ghana is indeed a country in a hurry, wanting to get much accomplished, to make up for lack of opportunities and for lost time. Hence it followed that Ghana launched her Second Development Plan on July 1st, 1959 (the First

While cocoa has replaced gold as the country's chief export, Ghana still ranks fourth among the world's gold producers. Gold mining operations give employment to almost 25,000 workers, of whom less than 1,000 are non-Africans.

Lighterage service by small boats and their cheerful crews is the means of unloading freight from larger vessels at Accra and other port towns at present. By early next year the large and modern deep-water port at Tema will be in use and will accommodate the easier entry and exit of goods; a modern harbour has been available at Takoradi for some years.

Development Plan having preceded independence). In introducing the Five Year Plan in Parliament, Dr. Nkrumah then as Prime Minister summarized its basic objectives in these words:

> We believe that it (the Plan) should show what we have to do—by our hard work, by the use of natural resources, and by encouraging investment in Ghana—to give us a standard of living which will abolish disease, poverty and illiteracy, give our people ample food and good housing, and let us advance confidently as a nation. We want to develop strong basic services—communications, power and water—so that we can provide a real and an effective foundation for the industrialization of our country; and we want to ensure the continued expansion and diversification of our agriculture on which, in the final analysis, all our plans depend.

In specific terms, the Plan calls for an expenditure of £G 350 million or about a billion dollars over the five-year period. This is rather an ambitious undertaking and implies considerable foreign borrowings—about two-thirds of the total—to complete all phases of the Plan. Earmarked for special attention is the expenditure of almost 300 million dollars for the Volta River Project which, briefly, is the harnessing of the Volta River for hydro-power to be used for the most part in the smelting of bauxite on-the-spot to produce aluminium. This project has been under review for some years and is being presently re-assessed by an American firm under the joint auspices of the Ghanaian and United States Governments. It is reported that a consortium of several large companies—Canadian, British, American and German — might eventually become interested again in this project, some of these firms having lost their original interest when a recent slump in world demand and prices for aluminium occurred.

Another third of the Plan's expenditures is estimated to take care of that part of the Development Plan which is in the form of public services—roads, communications, electricity, urban and rural water supplies, hospitals and schools; other substantial sums are allocated for agricultural and industrial development. Ghana is making, and will continue to make, great efforts to diversify her

G. V. Fraser

Cocoa beans being dried and made ready for shipment. Cocoa crops harvested twice a year account for two-thirds of Ghana's exports, averaging about $200,000,000 annually.

economy and to get away from a one-crop production. While cocoa is still "the economic life-blood" of the country's existence and will continue to receive special attention, this crop is one which is very susceptible to insects and pests which in the past have threatened to wipe out the entire industry. And although the individual cocoa farmers—the entire production is in the hands of 300,000 to 400,000 Ghanaian small-scale producers—are assured a fixed price by the State-controlled Cocoa Marketing Board, yet the country's revenues (of which a third is derived from cocoa exports) can be seriously affected by world price fluctuations. The possibilities of developing banana and tobacco production on a larger scale are proceeding favourably as well as consideration of new agricultural projects such as sugar cane and rubber for eventual processing or export purposes.

Further, the Government is desirous of attracting no less than 600 new industries to give the country an industrial base as well as to reduce the need of importing practically all its manufactured or processed goods as it is presently forced to do. Special inducements including tax relief or tax holiday are being offered to certain new industries for a period of five years with a maximum of ten years in exceptional cases. To date there have been sixteen official trade and economic missions to Ghana, from the United Kingdom, the Soviet Union, the United States, West Germany and Hong Kong to name a few, who are all eager to set up trade and commercial relations at this time. The British Mission which published a most useful report on their investigations observed that the general climate for investment in the country was favourable, that there are undoubted possibilities for investment for overseas countries, and that Ghana is being courted from many directions with offers of capital equipment and long-term services. It should be added that no special favouritism has been shown to one group over the other; in other words,

Permanent camp buildings are being constructed by members of the Aiyinase Unit of the Builders Brigade, consisting of young men and women of school leaving age learning various trades and skills by building roads, schools and water systems.

G. V. Fraser

Children stand in front of their mud and thatch homes in the Northern Region near Tamale and eagerly submit themselves to the camera. Although bashful at first, they are very friendly like their elders.

the policy of positive neutralism or non-alignment is maintained by Ghana's leaders in their dealings with both the East and the West. Incidentally, trade and commercial relations with Canada are being effectively carried out following the early establishment of Canadian High Commissioner and Trade Commissioner representatives in Accra.

To go along with this urge for industrial development the largest artificial harbour in Africa, to be completed early next year at an estimated cost of almost 50 million dollars, will be located at Tema, some eighteen miles from the capital city of Accra. A new community, this New Town of Tema, with modern housing and other adequate facilities such as schools, shopping centres, cinemas and a hospital has been literally created overnight where formerly stood an ancient fishing village. Urban growth will be rapid as well as orderly in this development likely to accommodate a population of 50,000 to 75,000 during the next five to ten years. Adjoining the harbour and the new community is a vast planned industrial area which has already attracted several internationally-known firms including a Canadian plant built at a cost of a quarter-million dollars and now in full operation.

Like other emerging and less developed countries Ghana is receiving considerable technical aid and support from the United Nations, the United Kingdom, the United States, Canada, Israel, and more recently from certain European countries. In all, technical experts in the country total between 100 to 150 at any one time. Simultaneously, under their own Government scholarship system (financed from the funds of the Ghana Cocoa Marketing Board) and from grants offered by United Nations agencies and other countries including Canada, there are several hundred students studying abroad, the greater number in the United Kingdom, the United States and West Germany. The attachments of the twenty United Nations experts in Ghana (representing ten different

Mass education and self-help projects are attracting thousands of persons, particularly in the rural areas. Here workers are producing cement blocks on a self-help project site with an officer of the Department of Social Welfare and Community Development in attendance.

nationalities) might be indicated since they reveal the professional and technical needs in some measure: economists attached to the Ministries of Agriculture, Finance and Commerce; statisticians assigned to the Government Statistician's Office; agricultural specialists on extension work; a fishing expert; a real estate evaluator training a corps of property assessors; a population specialist taking the first census since 1948; civil service and public administration advisers; mass education teachers; an adviser on employment and labour matters; specialists in public health and tropical diseases.

The aid and trade programme of Israel in Ghana has aroused considerable interest both within and outside the country. The Israelis established early contacts with the Ghanaians and have supplied personnel, materials, capital and know-how. Having solved many like problems in their country since their own independence, they have been most helpful in providing experts to Ghana to assist on matters varying from irrigation to poultry-raising. The Ghana Nautical College which is staffed by Israelis turns out 40 Ghanaian merchant seamen annually to man the Black Star Shipping Line which was jointly set up by the Governments of Ghana and Israel on a 60-40 percentage basis respectively. Under similar arrangements is the Ghana National Construction Company operating and carrying out the largest building, highway and airport construction jobs in the country. Likewise has a Trade and Payments Agreement made for increased commercial and trading relations between these somewhat far-removed countries from point of view of distance. A steady exchange of visits by students and cultural groups, political, trade union and agricultural leaders and specialists supplement and strengthen the social, economic and cultural bonds of these two minute nations which, originally, had little more in common that their recently acquired autonomy and self-direction.

As one may well gather, life in Ghana is anything but dull. It is gay and diverting but yet earnest and vibrant. In many respects it is the show-place of the emerging African nations. At all times it is under the close observance of outsiders—the majority approving, some a bit doubtful, a few maybe not too sympathetic. Accra, the lively capital, has become an international stop-off point for eminent visitors such as Prince Philip or Secretary-General Hammarskjold of the United Nations or Mr. Adlai Steven-

A female police sergeant and constable questions an escort officer about a suspect. The police staff is an exceptionally well-trained and disciplined corps under a recently appointed Ghanaian commissioner.

son; business men as well as jazz exponents from the United States; Indian textile merchants; bankers from the Netherlands; Japanese salt reclamation specialists; Canadian industrialists and professors; West German diesel railway producers; Burmese rice traders; Jugoslav and Czech machinery representatives. They and many others have come to see for themselves the vast changes which are taking place there; some of them have come to offer their wares or services in this bustling and stirring new country.

What have they found ? A land though not extensive but which is both productive and potential in its income from the farm, mine and forest. A folk who are friendly, smiling, laughing, singing and "high-lifing" but at the same time determined, eager, gaining confidence and meeting the challenge of their new rôle and responsibilities. After almost 500 years of foreign occupation and domination it would be too much to expect that a perfect system of government or a model set of institutions to our taste and liking should follow within the space of a few years. Emerging from a primitive, collective and tribal type of society (as Ghana has and as other less developed countries in Africa are about to do) it does not follow that they will or should adopt a duplicate set of our institutions, conventions or customs. Rather ought we to express amazement at the speed and progress to date of Ghana's political, economic and industrial achievements during her transformation from colonial outpost to respected republic within the Commonwealth.

External Affairs Minister Howard C. Green examines Ghanaian carvings on display at a celebration of Ghana's Third Independence Day at the Overseas Friendship Society, Ottawa. George Mensah, centre, is a student-in-training with the Geological Survey of Canada. The author is at left. Dominion-Wide

Parliament House is where Ghana's 104 members of the National Assembly sit in a remodelled chamber of horseshoe formation presided over by the country's President, Dr. Kwame Nkrumah.

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EDITOR'S NOTE-BOOK

John Grimshaw (*Edgeley—A Pioneer Village Reconstructed*) is a public relations counsellor associated with the Ontario Editorial Bureau in Toronto. A journalist who has worked for newspapers, magazines and radio, he entered the public relations field nine years ago. During much of that time, he has been closely associated with the conservation of natural resources and the early history of Metropolitan Toronto through his work with conservation and forestry organizations. He is a member of the Toronto Men's Press Club and the Canadian Public Relations Society.

* * *

Philip Stuchen (*Ghana—Colony to Republic*) has recently returned from a fifteen-month assignment in Ghana under the auspices of the United Nations. He was loaned from his present duties as Special Adviser in the Economics Branch of the Department of Trade and Commerce in Ottawa. During his tour abroad, Mr. Stuchen served as Economic Adviser to the Ministry of Commerce and has travelled extensively throughout Ghana and other parts of West Africa. Other previous international assignments have included his being a member of the Canadian Delegation to the International Truce Commission in Indo-China during 1955-56 as well as having served under UNRRA auspices in Germany in 1945-46. Mr. Stuchen is a native of Gananoque, Ontario, and attended Queen's University, Kingston, from where he holds his M.A. degree in political science.

* * *

W. H. Van Allen (*Canal Systems of Canada*) was educated in France and England. After spending some time in the service of Canadian Press and Reuters News Agency, in 1928 joined the publicity section of the Department of Trade and Commerce at Ottawa. Since 1940 he has been Chief of Information Services in the Department of Transport until his retirement earlier this year. Mr. Van Allen has written a number of articles for the *Canadian Geographical Journal* in the past.

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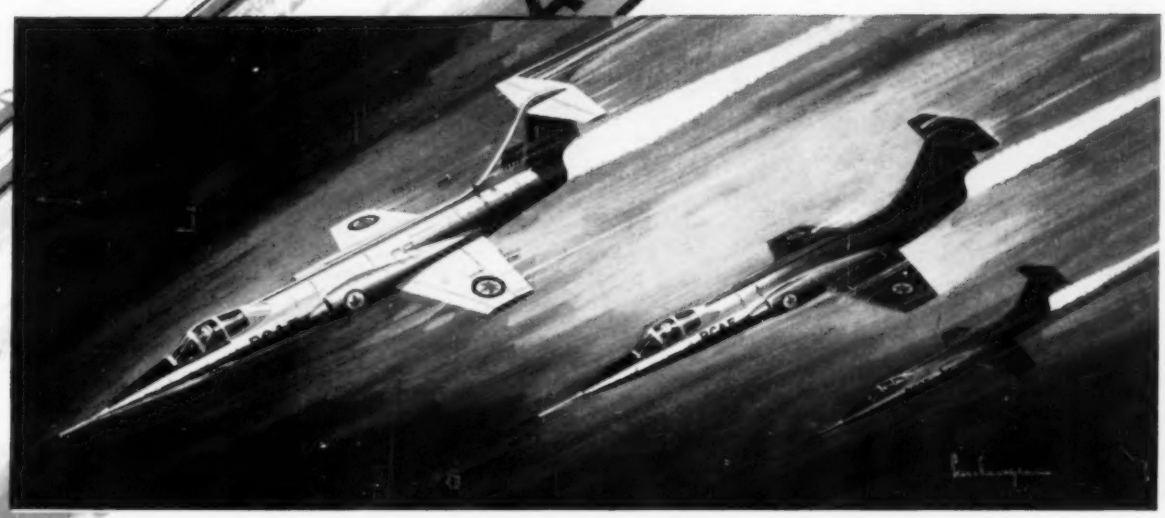

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(Messrs. Collins, Don Mills. 160 pp. $5.00)

The reading public is much indebted to Mrs. Adamson for letting us share, by means of her delightful book, a unique experience in her own home life. The opportunity of adopting and bringing up a baby lion would only be possible to someone in the position of an African game warden, where the surrounding circumstances would bring such an unusual proceeding within the bounds of reason and comfort for everyone concerned, and as Mrs. Adamson tells her story so easily and factually, one gets to feel that the adoption was the right and natural thing to do on a game reserve in Kenya.

The fact that an apparent attack was made by a mother lioness simply in defence of her cubs, lent poignancy to the case when the lioness was shot in defence of human life by one of a party that had gone in search of a man-eating lion. Mr. Adamson, the game warden rescued the three helpless cubs after much trouble and carried them to his wife who instinctively seemed to know how to comfort and feed the fluffy little orphans. She cared for them till the two stronger ones could be safely disposed of in a zoo and then the story centres round the third who grew up happily and in complete freedom as a pet and a member of the Adamson household. The exceptional gift of understanding on the part of the game warden and his wife sheds a new floodlight on the realm of animal psychology and the amount of responsiveness that can be evoked by proper treatment. The adaptation of her wild nature to human domestic ways, her complete freedom to go or stay as she pleased, and the amazing degree of mutual understanding on the part of man and beast reveal something new in animal behaviour where the large carnivores are concerned.

"Elsa" was the name they gave to their young feline friend and the most remarkable part of this story is the successful return of this young lioness to her normal wild life after she was fully grown, which is a marvellous tribute to the patience and intimate knowledge of animal life on the part of the warden and his wife. The title of the book indicates the wise understanding that directed this strange friendship. Elsa was always free to come and go, and she showed plainly that she preferred to come. On reaching maturity she was skilfully and gradually led into her natural bush life until she finally accepted, and was fully accepted by her wild companions, a crowning achievement on the part of her human friends.

The book is beautifully illustrated and tastefully presented, and is a pleasure to read from cover to cover.

SYLVIA SEELEY

* * *

Alberta Revisited

by Ken Liddell

(Ryerson Press, Toronto. 234 pp. $4.00)

In this handsomely illustrated and highly informative general guide book to a land filled with scenic wonders, Ken Liddell of Calgary records as a reporter rather than describes as an author. In short, crisp sentences he proceeds from fact to fact, legend to legend and from person to person to provide a kaleidoscopic catalogue of sidelights on this mile-high land of shorthorns and tall stories.

Mr. Liddell avoids being literary. One of the most memorable paragraphs in the book is one quoted from the random scribblings of a dust bowler who probably could have earned more by writing than from farming: "We are alone in a sightless mass of hurtling soil, stinging sand and thumping clods . . . millions in rich topsoil gone forever. That is the black blizzard, the most appalling thing in nature."

Geographers in particular will be intrigued by Mr. Liddell's basic approach to his subject, amplified by a useful bibliography and index plus maps. He divides Alberta into the four main quarters of the compass, adding a spine-shaped segment — the "Rocky Mountains backbone area." In the southeast — the shortgrass country; the southwest — land of foothills; the northeast — a corridor from Red Deer to the Territories including Edmonton and Lloydminster; the northwest — a treasureland of natural resources.

The parade of historic personalities is impressive. He tells of Charlie Noble of Claresholm, of John Ware, the pioneer negro cattleman. There is Happy Jack of the badlands in whose diary one finds the illuminating entry for April 29, 1909 — "Eight feet of snow, damn Sunny Alberta." There is also Bob Edwards of the immortal "Eyeopener" who once described Wetaskiwin as populated by 230 souls and three total abstainers. There are references to R. B. Bennett who became a prime minister and a peer of Britain's realm; of Anton Turla the Leduc dirt farmer who rode overnight the flood of new-found oil to gather an immense personal fortune; of Charles "Rainmaker" Hatfield; of John George "Kootenai" Brown; of Harry Taylor who claimed that Chie

Mountain was only a hole in the ground when he first reached Alberta; of Jimmy Smith, the Chinese-Canadian of the unlikely name whose money gift founded an important modern hospital; of Peace River Jim Cornwall and Twelve Foot Davis, Davis whose nickname was derived from the dimensions of one of his mining claims.

The book throughout deals mainly with the materialistic rather than the spiritual aspects of life in Alberta. Nevertheless the rugged courage, indomitable humour and humanity and the easy-going aggressiveness of the people constantly shine through the narrative.

One reads of the Hutterites, the Mormons and the remittance men "who may have been green but who were never yellow" — all the varied groups and sects who have made indelible contributions toward the upbuilding of a new province and of a provincial character.

There are passages about the Banff School of Fine Arts, the Eastern Rockies Forest Board (an object lesson to the world in watershed conversation) and even reference to the Crested Wheat and Rye Club, the members of which inspected wheatfields and then adjourned indoors to 'inspect' the rye.

Although Mr. Liddell skips from fact to fact with the agility of a sure-footed mountain goat he contrives to catch more than a passing glimpse of the unconquerable spirit of an enterprising, resourceful people living in a challenging, energizing environment.

DON W. THOMSON

Mr. Thomson was born and educated in Alberta; President, Canadian Authors Association, has been private secretary to two federal cabinet ministers from Alberta.

* * *

Essentials of Earth History
An Introduction to Historical Geology

by William Lee Stokes

(Prentice-Hall Incorporated, New Jersey, U.S.A. 502 pp. $8.75)

This engagingly written and attractively illustrated volume falls into three parts. The first, comprising seven chapters, is concerned with the principles of geology and palaeontology necessarily involved in any study of earth history. It is brief and generally to the point and touches on the most important aspects of the subject. The second part, of eight chapters, outlines the geological and biological events of which we have record, while the last five chapters are concerned with problems of interest to both palaeontologist and neontologist.

(Continued on page XI)

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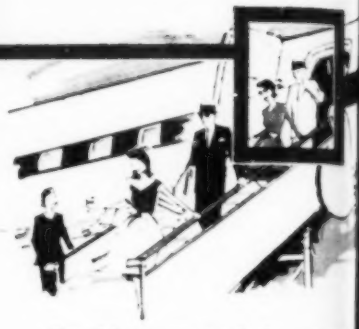

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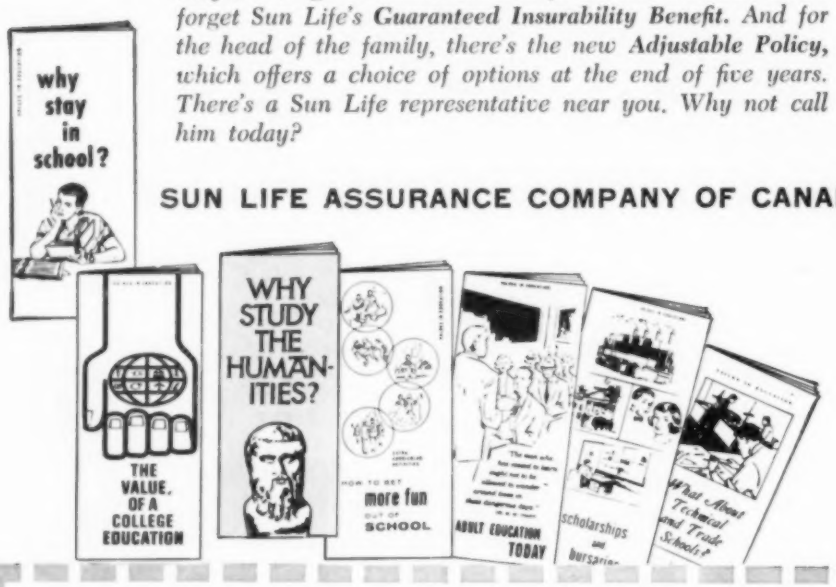

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Some account of the development of the different branches of geology and palaeontology is given throughout. From this it is clear that the author is primarily concerned with history of life upon this planet. Much less attention is given to the purely physical or inorganic history of the earth. The title of the book leads one to expect rather more treatment of the non-biological material than is the case. An up-to-date account of earth history, covering the development of all the major structural and geographical features of the planet's surface has yet to be written (and would indeed be a hazardous undertaking).

Further, since so much of the book is taken up with organic matters, more attention might have been given to the part played by organisms in rock building and in modifying geographical and sedimentary environments. Nevertheless, Professor Stokes is to be thanked for the care he takes in dealing with Pre-Cambrian, "pre-geological" and "pre-palaeontological" events, and for stressing the difficulties which beset our interpretation of those parts of the record. Particularly welcome are those sections dealing with the latest advances in geological or palaeontological techniques and ideas, as for example the chapters on geological time and its measurement, dispersal and migration of species, extinction and replacement.

The summary statements at the end of each chapter are crisp and valuable and the lists of additional reading have clearly been compiled with care. A twenty-nine page Glossary of Selected Terms at the end of the book is generally good, though a few of the definitions seem unnecessarily vague. The index is good. There are one or two minor errors in the text and figures but these should give offence to no-one but a pedantic specialist. One or two printers' errors remain. The illustrations, both photographs, diagrams and tables are of a very high standard and even in these days of beautifully produced geology texts, stand as an exceptionally good collection.

Essentials of Earth History should be a welcome addition to the bookshelf of any student of living things of fossils or of geology. Its clear exposition and treatment of some well-known palaeontological problems will be welcomed by teachers, both geologists and biologists. The general reader will be attracted by its style and pictorial content. One of Professor Stokes' stated intentions was to include in the book much supporting material of a non-geological nature to emphasize the interdependence of earth science and related fields and in this he has certainly been successful.

D. L. DINELEY